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AN INVESTIGATION INTO THE MERITS OF THYROIDECTOMY AND THYRO-LECITHIN IN THE TREATMENT OF CATATONIA.*

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Among the large group of mental maladies that afflict the adolescent, one form is distinguished, by certain neuro-mental characteristics, that does not belong to any other of the sub-groups of this division of the insanities. More than three decades ago this sub-group was differentiated and described by the German physician Kaulbaum (1874), and from one of its most prominent symptoms—muscular spasm or rigidity—was named catatonia. It is a common form of mental disorder, affecting for the most part young persons between the ages of eighteen and twenty-five, yet, is not absolutely confined to these years, as, rarely individuals approaching the thirties are also affected by it.

It is a malady of fairly definite progression, and in the largest proportion of instances tends to a complete annihilation of all the mental activities, the sufferers in the end stages being relegated to an intellectual plane below that of the beast of the field; in fact, far below them, for they become incapable of speaking coherently, of feeding themselves, or of attending in any way to the daily needs of the body.

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In the larger proportion of cases, catatonics go through several definite stages before a complete or partial dementia is attained. Most frequently the malady progresses in the following order: First, there is a stage of onset, or prodromal stage, with entire alteration of the character, as well as of the patient's disposition; this eventually passes into a stuporous condition, or period of mutism, the passing from one to the other being attended by a leucocytosis of considerable intensity. The stuporous state lasts for a considerable period, it may be weeks or months, broken now and then by the sufferer waking up to partial or full consciousness of his surroundings. After a time a remission may come, in which the person returns to a more normal condition, yet is never quite himself, or the individual may pass from the stuporous condition into one of motor-mental hyperactivity, with poor ideation, a period of variable duration, after which he slowly and progressively dement. Like that of paresis the duration of the cycle may be a variable one. In some instances the entire cycle may be accomplished within a few months, or it may take years before the stage of dementia arrives.

In the above outline we have only typical cases in mind, the tendency with many being to wake out of the stupor for short periods, during which they may be coherent in thought; or short stages of excitement may be interspersed throughout the stage of catatonic stupor. Likewise, one occasionally sees much milder cases in which the motor symptoms predominate over the mental ones, and which do not run the typical course as given above.

The mental fatalities, in our experience of the disease in this region, have been so distressing, not more than three to four per cent recovering but a part of their mental vigor, that any means of relief, no matter what, would be gladly welcomed.

Many of the catatonics, in their school life, have shown the average intellectual activity, others have been above the average in intellectual attainments, still others have been of a lower mental level, descending to the grade of the imbecile.

This fact offers subject matter for consideration. If persons of presumably stable intellect are stricken with the disease equally with those of a lower intellectual plane, we may at once remove the malady from among the psychoses appertaining to the imbe-

cile class, and look for its origin among other than constitutional disabilities, or, better, separate it from those that belong to inherited tendencies derived from the protoplasm of mother or father.

Our local hospital records are not sufficiently trustworthy to be of assistance, and our private ones are insufficient to enable us to determine the degree of insane heredity in these cases. Certainly they do not show a greater percentage than one-half who have an ancestral tendency to the psychoses. Kraepelin and Bruce also give similar figures.¹ If, in the large proportion of one-half of catatonic cases, we are unable to establish even a trace of ancestral neurotic taint, we must certainly look further for a definite cause.

For a generation these cases have been ascribed by numerous writers to an auto-intoxication, but from what source, and how acting on the nervous system (in particular), as well as on the general body, no one has yet ventured an hypothesis, besides Kraepelin, who ascribes the mental changes to alterations in the activity of the generative organs about the age of adolescence.

For the past two years the writer (Dr. Berkley) has tried in a number of ways to promote a return to the normal in cases of catatonia, but with entire lack of success for a time. All manner of drugs that we thought might favorably influence the malady were used. Tonics of all sorts and descriptions, phosphorus compounds, especially the glycerophosphates, iron, manganese, arsenic, cod-liver oil, hyperalimentation, and lastly iodine. Of the entire list of medicaments iodine was the only one that had any effect, and it seemed to intensify the symptoms, even when the dose was small (1/250 gr. iodine, as iodized starch). Under the use of iodine such patients would wake up out of their stupor to some extent, become talkative and excited, and show increased dermatographia, more highly exalted reflexes, an increased hyperidrosis, as well as a higher pulse rate, but the mental condition did not mend perceptibly, and as soon as the drug was withdrawn they reverted to the earlier condition. It was distressing in the extreme to see a number of young men and women, at the advent of the most useful

¹ Wolfson (*Allg. Zeitschr. f. Psych.*, LXIV), the most recent writer on the subject; figures are not here included for the reason that he does not sharply separate the several forms of adolescent psychoses.

period of life, show the most profound alteration of character, stupor, excitement, and finally dementia, without being able to help them at all, so we persisted in our endeavors to find relief, always led by the belief that we were dealing with an auto-intoxication, since this hypothesis presented the best solution of the etiology of the malady. During the course of the investigation we compared, serially, the symptoms of Grave's disease with those of catatonia, and were able to find a certain resemblance between the two maladies, although it must be admitted that the resemblance was superficial, but sufficient to attract attention. Now, holding in view a possible thyro-intoxication hypothesis, we tried after the ordinary drugs had failed, a number of the glandular extracts as well as other animal preparations. Testicular, ovarian and thymus juices, various nuclein preparations, parathyroid, thyroid, iodothylin, epinephrin, alcoholic solution lecithin, and others were used. From but two of the several preparations did we obtain any effects. Iodothylin made the patients worse, as did the desiccated thyroid in the ordinary dose of five grains three times a day. As under the iodine the patient awoke out of stupor to some extent, or if the dried gland was pushed he became excited, with increased hyperidrosis and muscular and reflex reactions. The lecithin induced an increase of the leucocytosis, already present, while the red cells increased rapidly. The patients under the lecithin improved physically, but often, when the cases were at all old, without betterment in the mental symptoms. Early cases did much better so far as the mental symptoms were concerned.

In the early winter of 1907, a more systematic investigation was begun at the City Detention Hospital. The aim at first was to induce a high leucocytosis, with the design of producing rapid tissue metabolism, and, secondly, to observe the changes in the condition of the several patients, mentally and physically, during the treatment. This part of the investigation was principally through blood examinations (the urine was examined in addition, but developed nothing of importance), and was directly under the charge of Dr. Hala, of the House Staff, who, after a protracted series of examinations, using various drugs and the several nuclein preparations on the market, of French and American derivation, found that an alcoholic solution of lecithin was the most

certain and efficient medium to increase both red and white cells, thus confirming observations made at an earlier period.

Dr. Hala unfortunately was unable to complete his most interesting work, which, in the main, was giving results similar to those of Bruce of Edinburg on catatonic blood, and for a time this portion of the investigation lapsed.

As previously stated, we had come to the conclusion that in catatonia we had, possibly, to deal with a perversion of the functions of one of the ductless glands, in particular the thyroid body, the latter conclusion drawn from the passing similarity of certain symptoms common to both this malady and Graves's disease, and, in particular, the increased reflexes, the heightened mechanical muscular irritability, hyperidrosis, tremor, the skin changes, and profound loss of weight. Acting upon this hypothesis, we next tried the experiment of feeding our catatonia patients on small doses of desiccated thyroid, one or two grains each day, with the idea of supplying a small portion of normal gland to the bodily economy. Alternating with the thyroid, week by week, lecithin was given in the form of an alcoholic solution to keep up the leucocytosis and increase constructive metabolism.

We first fed four patients upon this regimen, giving all, in addition to the medicaments, large quantities of milk. One case, a quite early one, got well at the end of six weeks, and has remained so for eighteen months. A second case was well at the end of four months, and has not relapsed. A third example did well at first on the thyro-lecithin, but relapsed at the end of four months, owing to the accidental death of a brother. This lady is again, apparently, well, shows no signs of dimming of the intellect, but she is still at times inert, and complains of a feeling of "emptiness" in the head. The fourth, a much more advanced case, did not do so well, brightening up somewhat, but remaining inert and incapable. None of these cases were of any considerable duration, except the last, in which the symptoms of the malady had endured for more than a year. The earliest one was of not more than two months standing. In all of them the thyroid was given for one week, and then alternated with the lecithin for another week; after a time, as the patients grew better, the lecithin was given alone.

This thyro-lecithin treatment, while brilliant in its results when compared with that before obtainable, was not at all satisfactory with cases of longer duration, upon which it seemed to have little or no effect, so we sought further to determine if there was any other means of relieving them.

As we were now further impressed with the hypothesis that we were dealing with a perversion of the thyroid gland, we obtained permission, through the house physicians, from the relatives of several patients to have done upon them the usual surgical operation for exophthalmic goitre, with the hope of changing the quality of the secretion of the organ, or restoring it to a more natural state. Dr. R. H. Follis performed a partial ablation of the organ in ten cases, one in June, one in July, two in October, and one in December, 1907, one in January, three in February, and one in April, 1908. Of these, nine presented the typical form of catatonia as to symptoms, and with the usual mushy thyroid gland, peculiar to the malady, the other equally typical as to symptoms, but with a colloid goitre that had been present since puberty.

To our great surprise and pleasure the three earlier cases recovered their mental equilibrium within a few days or a few weeks after the operation, but there were differences in the manner of recovery. Cases II, III, and IV recovered slowly, little by little, and showed no tendency to relapse. Case I, on the other hand, progressed rapidly for a time, then the remaining half of the thyroid gland increased in size, and with the hypertrophy came a renewal of the mental symptoms, though the patient never became as apathetic and stuporous as before the operation. After a time the goitre decreased in size, and with the diminution came increased mental activity, as well as decrease of the motor symptoms. Finally the patient settled down into a normal condition, a state that has not changed for more than a year. (None of these patients had any drugs given them during the period of convalescence).

The fifth case did not do so well. He was an example of the disease far more advanced than the others, and the stage of mutism had lasted full five months at the time he was thyroidectomized, also in this instance but a small portion of the gland was removed, much smaller than in any of the others.

This patient brightened up after the operation, and for a time it looked as if he also would recover, but he gradually went back, though not quite to the original state, for he was no longer mute and untidy, spending the whole day in bed or on a settee, but spoke a little and that clearly, was tidy in his habits, and on occasion could be induced to play baseball with considerable interest. A second lobectomy was later performed on this patient, with complete recovery of the former mental attainments.

The results given by the pathological examinations made by Dr. McCallum are confusing and indefinite. In Case I, a definite pathological condition could not be made out other than that appertaining to colloid goitre. In Case II the condition was suggestive of exophthalmic goitre. In Case III there was slight fibrosis of the organ, and the same was present in Cases IV, V, and VI. In Cases III and IV a chemical examination of the iodine content was also made. Case III had a very high iodine content,² while Case IV had a relatively low one.

Reverting to Graves's disease as the best known example of thyrotoxæmia, one finds certain resemblances between the mental and physical symptoms of that malady and catatonia that are interesting, if not significant. The three cardinal signs of the Graves's malady are only noticeable by their absence, also in catatonia the blood pressure is only high at certain stages of the disease, but in both there is rapid pulse, muscular tremor, hyperidrosis, over-active eye, as well as other, reflexes, increased mechanical muscular excitability, dermatographia, hyperidrosis, skin pigmentations, and rapid loss of weight, disturbance of the menses, and vaso-motor pareses.

In both there are psychical alterations, which though ordinarily less severe in Graves's are still quite noticeable. Especially is this true for the prodromal part of both disturbances, when insomnia, headache, vertigo, a change in disposition, and irritability are commonly noted.

The resemblance is far from perfect, yet there is a certain significant coincidence of symptoms, even though the main features of the two diseases are seemingly far apart.

² Due to the fact that the patient had been on potassium iodide, up to two weeks before the thyroidectomy.

The state of the thyroid gland, during life, necessarily commands attention. One finds two conditions. First, an occasional gland that shows more or less hypertrophy, and has the general aspect of belonging to the ordinary colloid goitres. These instances of enlargement are few in number, and careful inquiry into their origin elicits the fact that the swelling of the gland began years before the advent of the mental symptoms. It is accordingly more than doubtful if the colloid form of goitre and catatonia have any relation to each other, and their coincidence is accidental. If the secretion of the organ is perverted, other disturbances of the glandular activities come into play at a later period than that in which the colloid matter begins to accumulate.

In the second, as well as far more numerous class of cases, the one that may be considered as typical of the malady, we find an altogether different state of affairs. The neck over the region of the thyroid looks full, while the gland to the finger is soft and mushy, with an occasional hard knot here and there noticeable in it, which is in contrast to the firm gland found in healthy individuals. Usually the gland is about the normal in size, sometimes it is below the normal. The varying position of the gland makes its quantitative presence uncertain, as occasionally the bulk of it lies behind the trachea.

Blood alterations are more constant in catatonia than in any other form of mental malady, hephephrenia and paresis excepted. In the earlier periods of the disease a leucocytosis of from 11,000 to 18,000 per cubic millimetre is fairly constantly found, which may rise at the beginning of the stage of stupor to a much higher figure (30,000 to 40,000). The relative proportions, between the several forms of white corpuscles, are also changed, and the percentages of childhood are again attained. The small lymphocytes are relatively high, the large forms are unaltered or low (occasionally the reverse condition is found, and the percentage of the large lymphoid cells may be as high as 40 per cent, in one instance up to 43 per cent), the neutrophiles vary from slightly below normal to a low point (48 to 50 per cent), while at certain times the eosinophiles are low, normal, or increased. Mastzellen are occasionally seen; myelocytes are not found so far as we have been able to determine, and are certainly not present in appreciable numbers.

Changes in the red cells cannot be spoken of with any degree of assurance. The Paoli method, it is true, shows a certain stainable body, by him termed *hemaglobigenic*, with constancy, but these bodies are found under other conditions, besides the technique of the method is not free from objection.

In examining patients suffering from catatonia, one is often impressed by their extreme pallor, and apparently anaemic condition, yet in blood examinations one always finds the hemoglobin relatively high, while the number of the erythrocytes is also comparatively high, and this, when every precaution is taken to insure outflow of blood from the ear without pressure. The explanation of this fact is, probably, in that the patients partake of fluids in very small quantities, as many of them have to be fed by the tube, while others refuse to partake of but small quantities of water.

After the partial ablation of the gland, in the few cases operated upon, the differential count has shown very considerable alteration in the relative proportions of the leucocytes, as well as in the general estimate of the total number of these cells. Within the first 48 hours there is a high leucocytosis, with (in the cases that recovered) a drop shortly afterwards, and then a gradual return to the normal proportions between the white elements.

Arguing from the fact that the administration of iodine preparations (in particular the iodized starch), as well as thyroid derivatives, results in some change in the condition of the patients, we might premise that in these cases there was a perversion of the thyroglobulin, with excess of the iodine content, but the chemical examination in the one case does not bear this out. Nevertheless, the excess of iodine content, if it should actually prove to be the case, cannot be all, as has been demonstrated by Hunt,¹ who fed preparations of the thyroid gland of still-born infants and kids to mice, and found that this thyroid, from which iodine was absent, increased the resistive lethal power of animals to acetonitrile, though not by any means to the degree that the older iodine-bearing gland did.

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state of our knowledge, for clinically we have no means of differentiating them or getting at them.

CASE I.—Sophy S., æt. 19 years, white, single, native of Maryland. Diagnosis, catatonia.

Family History.—The father died at the age of 40 years of pneumonia. He had been intemperate. The mother is living, æt. 54 years, is healthy, but of hysterical temperament. Besides the patient there were eight brothers and sisters, of whom six are now living, all in good health. Two children died in infancy, one of "spasms" at the age of eight months, the other at 17 days of pneumonia. There was one miscarriage at six months. There is no history of psychoses in the mother's family. The ancestral history of the father is unknown.

Past History.—The mother was very hysterical during the fetal life of the patient, but the birth was quite natural. Measles at 11 years was the only disease of childhood from which she suffered. Menstruated at 15 years; regular, but attended by pain at times, and severe headache. Patient made good progress at school, which she attended for six years. A slight goiter was noticed about the time the menses began, but this did not increase in size. Has never used intoxicants, drugs, or tobacco. Has been employed as a saleswoman since fourteen years, to the beginning of the present illness, and until that time gave satisfaction to her employers. At home the surroundings were moral and pleasant.

According to the statement of the mother and brother of S., the first signs of a departure from mental health was in September, 1905, when she became depressed and had numerous crying spells, also she persistently blamed her mother for not raising her for a higher station in life, that she should have been better educated in order to meet the needs of her future life. These ideas were in part derived from the man to whom she was engaged to be married, who thought himself of a higher social plane than S. Later there were frequent quarrels, and finally the breaking of the engagement. To this some of the depression was due.

However, she remained at work until February, 1906, when she was advised by her employers to give up her position and rest for a time; the reason given was that she had become extremely forgetful and indifferent.

After this she remained at home, sometimes trying to work, more often not. All this time there was severe and protracted headache, which tended to increase as the depression deepened.

For several months longer she remained in about the same condition, reading the Bible and praying constantly, but on February 23, 1907, the condition rapidly changed; she became excited and unmanageable, and had grandiose delusions.

According to the family physician's statement, the girl was of normal mentality until January, 1906, when in consequence of the mentioned quarrels she became melancholic. During the spring of the same year this passed away, but she became very erotic. This had also passed by the early

fall, and only toward the end of February, 1907, did she become unreasonable, unmanageable, and destructive.

Present State.—Admitted to the Detention Hospital March 2, 1907. At this date she was mute, restless, apathetic, catatonic, with marked negativism. The clothing was untidy and unkempt.

Examination.—The patient is a girl of medium build, light complexion, fairly intelligent physiognomy, but with mask-like expression. She is apathetic and will not speak. Eyes do not protrude. Pupils, 2 mm. equal, reactive to light, sympathetic, and psychoreaction. Eyesight normal, retina and optic nerves normal. Tremor of tongue, hands and facial muscles. Head regular in shape, index 81, circumference 54 cm.

Nutrition only fair. Skin is without eruptions, but oily. Slight puffiness about the cheeks. Moderate dermatographia. Tactile and pain sensations uncertain, apparently slightly dulled. Deep and superficial reflexes overactive. Muscular mechanical excitability much above normal. Considerable sweating about hands and feet, and generally lowered vaso-motor state. Heart sounds, especially the second aortic, accentuated. Lungs normal. Pulse rapid, tension low. Temperature fractionally above normal.

The presence of delusions or hallucinations could not be determined on account of the mutism. A blood examination made the day after admission showed a leucocytosis of 20,000. The urine was negative.

March 3 to 12.—Patient has been considerably excited for several days. Hallucinations have been pronounced. There has also been much motor agitation, singing, dancing and shouting, and occasionally answering imaginary voices. Is very incoherent and rambling in response to questions. At times the language flow is so rapid that only single words, without connection, can be made out. Negativism and other physical signs of the malady are pronounced. S. is sleepless, refuses food, and hypnotics are necessary.

On the 15th of the month the patient quieted down, and again became mute, with the customary apathy, indifference and catatonic rigidity. She has gained slightly in flesh, while the face has become more puffy. S. will neither read nor work, and spends her days standing in a corner, without motion. When taken out of doors for an airing, she apparently does not notice anything around her. Is not theatrical or impulsive. Is untidy in her habits.

From the last date to June 27, when a partial thyroidectomy was performed, there was practically no change in her condition.

An examination made June 26 showed her to be absolutely mute and unresponsive to stimuli. The pupillary reactions, including psycho-reaction were plus. Mechanical muscular irritability, deep and superficial reflexes plus. Dermatographia well-marked. Slight tremor, with occasional spasmodic jerking of the head, or occasional clonic spasm of the orbicularis oculorum. No eruptions or bronzing, but skin oily, especially about face and neck. Hands clammy with cold perspiration. Lowered vaso-motor condition. Blood pressure 170 mm. R. R.; pulse 87 to 90. Accentuation of second

aortic and second pulmonary sounds. The bronchocele is not larger than in March. Neck over goiter measures 33 cm. Thymus is absent. Area of splenic dullness normal.

Operation [Dr. Follis], June 27, at 3 p. m. About four-fifths of the right lobe of the thyroid gland was removed, the upper and lower poles being spared in order to avoid any possibility of injuring the parathyroid glands; also to avoid additional complications. The portion removed measured 6 cm. in length, 4 cm. in width, and 2.50 cm. in thickness. It presented to the eye the usual appearance of a colloid goitre. The gland was much congested. The portion removed was preserved in Müller-formol, and in absolute alcohol for microscopic examination.

By 6.30 o'clock, the patient had awakened from the ether narcosis, and talked fairly intelligently to the nurse. She soon became restless and excited and inquired for what purpose the "hard collar" was around her neck; also complained of it hurting her. Vomited once. Had hallucinations, seeing her mother in the room. At 8 p. m. was given a hypodermic of one-fourth grain morphia, and slept until 4 o'clock the following morning.

June 28.—Awoke and asked nurse to raise her head so that she could take a glass of orange juice comfortably; also asked that her mother be sent for. Seems perfectly coherent and oriented as to person and place. Pulse 147; T. 98.9°; R. 28. Was quiet and coherent during the day, but at 6 o'clock p. m. became loquacious, incoherent, and sang snatches of a popular song. Evening: pulse 130; T. 99°. Was given $\frac{1}{4}$ gr. morphia at 8 p. m. and slept well until morning. Awoke at 8.10 a. m. and said "good morning" to the nurse. Ate a good breakfast, but complained of everything tasting peculiarly. Said she felt splendidly.

June 29.—This morning the face is very red and somewhat swollen. Pupils 3.50 mm., hyper-reactive. Reflexes, muscular mechanical excitability and dermatographia, unaltered. P. from 120 to 130; T. 98° to 99°; R. 22. Conversed perfectly coherently to the physician in the afternoon, but was quickly wearied. Becomes mute at times. Wound healing nicely.

June 30.—Slept well without morphia the entire night, and conversed pleasantly and intelligently with the nurse on awakening. Asked for some work to do, and embroidered for a time, doing the work creditably. P. 110 to 130; T. 97°; R. 22.

July 1 to 4.—Sleeps well, appetite good, eyes bright, pupils 2 mm. Face shows a decided change, as it is no longer red and puffy. Hands not so clammy and perspiring. Patient takes lively interest in her surroundings, inquires about other patients, and was allowed to see her mother, with whom she conversed for some time. Talks little to the physicians, but is cheerful and answers questions to the point. Was allowed to go out of doors in charge of the nurse. P. 95 to 96; T. 98.6° to 99°. Wound healing rapidly.

July 5.—S. is much quieter and more apathetic to-day. Would not speak to the physician, but laughed in a silly way, or turns the head with a jerk to the side. Pupils are 2 mm., quite reactive. Demographia marked.

Deep reflexes not so exalted. Mechanical muscular excitability slightly lessened. Hand dry and reddish. T. 98.7° ; R. 21; P. 95 to 96. *The left half of the thyroid gland is beginning to hypertrophy.*

July 6 to 15.—The patient is quiet most of the time, apathetic, indifferent, sometimes mute for hours, sometimes talking incoherently. Laughs in a silly way, and is fast becoming untidy. The T. has risen to 99.2° ; P. 80 to 82. Wound entirely healed.

July 17.—Pupils equal, $2\frac{1}{2}$ mm. Deep and superficial reflexes much exaggerated. Dermographia and muscular mechanical excitability greater than a few days ago. Extremities cyanotic and bathed in cold sweat. Fairly constant twitching of face and lips. The head is jerked occasionally from side to side. Is mute the greater part of the time, but at others she talks incoherently, though she will reply to direct questions. If the questions are persisted in she becomes rambling and incoherent. The face is again becoming bloated. The hypertrophy of the thyroid gland is still increasing, the neck now measuring 35 cm., 2 cm. more than before the thyroidectomy.

It was decided not to interfere in any way with the condition of the gland, medically or surgically, under the belief that after a time the enlargement would subside of itself.

July 18 to 24.—The patient's condition is a little better. She now does some work and at times speaks consistently and coherently. T. 98.5° to 99° ; P. 95.

July 25.—The motor symptoms are about the same. Extremities cold and covered with clammy sweat. T. from 98.6° to 99° ; P. 97; R. 22.

July 26.—Is menstruating for the first time since admission. The general condition of the patient is good, and she has put on some flesh.

August 4.—Mental and motor state much the same as in last report. Is impulsive at times, swears freely, and is mischievous. The thyroid gland is beginning to decrease in size.

August 14.—Motor signs not so marked. There is no negativism or twitching of the facial muscles, or tremor of the tongue. Weight 134 lbs. The pulse has a low tension. The second aortic sound is accentuated. T. 98.5° to 99° ; P. 95.

August 20.—To-day there are more evident signs of mental improvement. Converses coherently and works well. The thyroid gland is still decreasing. P. 96; T. 98.6° to 99° .

August 23.—Pupils $3\frac{1}{2}$ mm. in diameter, reactive to light and sympathetic stimuli. Other motor phenomena unchanged. Hands and feet are warm, but remain somewhat cyanotic and perspiring. Negativism absent. Is now completely oriented as to place and person. There is no longer a tendency to impulsiveness. Sleep and appetite normal. Pulse contracted, tension low, regular in rhythm. Neck 34 cm. T. 98.6° to 99° ; P. 96; R. 22.

August 26.—Left pupil 4 mm.; right pupil $3\frac{1}{2}$ mm.; reactive. Weight 139 lbs., a considerable gain. Patient prevaricates constantly, but is coherent and anxious to go home. If closely questioned becomes loquacious and swears. Is again inclined to be impulsive.

August 27 to September 9.—Since the last note was made there has been marked improvement. S. reads a good part of the time, and can give a fair account of what she has read. Is anxious to assist her nurse in the ward work. Is seemingly quite rational and is well-behaved. There is also some change in the motor signs. The pupils are $2\frac{1}{2}$ mm., equal and normally reactive. The hands are cyanotic, but warm, also there is much less perspiration. The twitching of the facial muscles has almost subsided. Dermographia is present. Muscular mechanical excitability and the reflexes are normal. Shows slight mannerisms in speech. T. 98.6° ; P. 74 to 80.

September 29.—S. continues to improve. Is industrious, perfectly good tempered, and it is difficult to find any departure from normal mentality. The physical signs are about the same as when the last note was made. T. 98.6° ; P. 80; R. 20.

The patient was sent home, with instructions to report on October 8.

October 8.—Patient has been home for a week, and returns in quite normal mental condition. The mother states that she has been industrious, good-tempered, and that she sees no difference in her daughter between the present time and before she was taken ill. Her memory for the past has improved wonderfully; she is well-conducted, and in no wise erotic. The physical signs have not entirely abated. The mechanical muscular excitability is slightly plus, as is also the dermatographia. The deep and superficial reflexes are still somewhat exaggerated, though by no means so well-marked as in June. The pupils are 2 mm. reactive, though normally so, to light, sympathetic and consensual stimuli. The patient has gained considerably in flesh. The pulse is 80, with continued accentuation of the second aortic sound. On slight excitement it rises to 90 beats. The right thyroid is not palpable; the left half is considerably enlarged. The neck measures 33 cm. in circumference. The gland is firm. There is now a slight area of dullness, not more than 3 cm. in diameter, over the region of the thymus gland.

November 8.—Patient reported to hospital, but her condition remains unchanged.

December 7.—Patient is bright; memory good, especially for dates; is rather indolent at home; color good; weighs 158 lbs. Was shown to class. Neck over thyroid measures 32.5 cm.

The following letters show in some measure the differences in the patient's mental condition; the first one is incorrectly dated, the patient then being in the Detention Hospital; in the second the date is correct. Both are in response to requests of the house physician.

BALTIMORE, 2/16 1907.

Mr. C. K. Stewart.

DEAR SIR—Kindly inform me as to the condition of the state of my brother's health in regard to the supposed insanity by which he was conferred upon him by laws of the state of Md. On said date and refer him to the said doctor in case the condition improves. I will offer a reward of

\$100 and costs to said owner in case he improves. He was sent to Spring Grove Asylum on said date and declared insane. Any information regarding same kindly inform him.

Address City Hall,
Baltimore, Md.
Calvert and Saratoga
[Signed S. D. S.]

BALTO. MD. Sept. 20 1907.

DEAR DOCTOR.—I wish to thank you for your kindness for allowing me to go home, which I appreciate very much. I also thank you for your promptness and for being so attentive to me. Especially do I thank you for your kindness and courtesy immediately after the operation. Understand I appreciate every thing that has been done for me but my most earnest desire is that I shall never see this place again.

I remain,

SOPHIA S.

April 5, 1908.—S. has not relapsed to this date.

July 25, 1908.—Patient continues to be normal.

September 25, 1908.—There has been no change in the girl's mental state.

Thyroid Gland. Examination by Dr. McCallum. S. S.—The alveoli are distended with homogeneous colloid which, however, show some variations in its standing qualities. Some alveoli are filled with pale gray, others with pale pink, and others with bluish pink color. For the most part they are larger than normal and their epithelial cells are very low and flat. In some places, however, the large alveoli are surrounded by very small ones. There is in most instances no distinct folding of the alveolar walls. In one or two alveoli, however, there is a remarkable scalloping of the epithelium by its being uplifted by capillaries.

The above case represents one of the usual forms of the malady in this region, with a somewhat prolonged prodromal period. At the time of the partial ablation of the thyroid, the symptoms were entirely typical of the stage of mutism, and for more than three months there had been no improvement, but, on the contrary, a slow downward trend toward the final stage in the realms of a terminal dementia. Within forty-eight hours after the partial removal of the gland there was a complete change in the psychical manifestations, and a rapid return toward the normal in the motor symptoms. One week after the ablation, the left half of the gland began to show signs of an hypertrophy, and as this progressed, the mental-motor symptoms returned, almost with their former intensity. Nothing whatever was done to change in any way the progress of the thyroid hypertrophy, beyond feeding the patient liberally and attending to the alimentary canal; besides, the condition of the patient was daily watched.

After a time the swelling of the half-gland began to decrease in size,

and with the decrease came an alteration in the physical as well as motor reactions. Gradually there was a return to normal mental activities, so that by October 8, 1907, or 104 days after the ablation, the girl had returned to her earlier natural state, except for some remaining traces of too active reflexes and mechanical muscular excitability.

At the October examination a slight area of dullness was found over the thymus region, which had previously not been apparent. This could not be well accounted for except on the ground of a hyperplasia of the gland following the thyroid ablation. It was distinctly not present before the operation, as the thymus region was carefully examined for any dullness.

BLOOD EXAMINATIONS.—S. S.

Date.	Red cells.	White cells.	Hemoglobin.	Small monos.	Large monos.	Eosin.	Polyns.	Mastz.	Trans.	Blood Press. (R. H.).
March 2, 1907*.....	3,000,000	19,600	60%	8.1%	10.1%	0.9%	80.9%	.0%	..	..
" 7†.....	3,290,000	18,000	68	11.2	9.5	1.2	78.3	.0	..	..
" 17‡.....	3,000,000	20,000	63	12.0	9.1	1.4	77.0	.5	..	..
" 27.....	3,200,000	17,200	70	13.0	11.8	1.0	74.2	.0	..	..
April 1.....	3,500,000	12,000	70	18.0	10.0	2.0	70.0	.0	..	..
July 28.....	4,500,000	17,800	75	29.0	1.5	2.0	66.0	.5	1.0%	115
Aug. 14.....	5,100,000	12,800	80	21.0	2.0	3.0	72.0	.0	1.0	125
" 21.....	5,250,000	9,600	80	22.0	2.0	1.5	73.0	.0	1.5	135
" 30.....	5,400,000	8,700	80	25.0	2.0	1.0	70.0	.0	2.0	125
Sept. 8.....	5,500,000	9,000	80	24.0	3.0	1.0	70.0	.0	2.0	125
" 13.....	5,900,000	8,200	80	28.0	5.0	1.0	65.0	.0	3.0	125

* Patient excited.

† Patient quiet.

‡ Mute; marked negativism.

CASE II.—John Y., æt. 21 year, a native of Baltimore, by occupation a railway car cleaner, was admitted to the Detention Hospital, March 4, 1907. Diagnosis, catatonia.

Family History.—The father died of a pneumonia, as a result of alcoholic excesses. The mother is living and intelligent, but suffers from "asthma." The patient is one of five brothers and sisters. Of these two brothers died in infancy, also a sister of pneumonia at the age of fifteen years. The other sister is healthy, mentally and physically. A maternal aunt had three attacks of periodic insanity, dying during the last one.

Past History.—The patient's birth was natural. He suffered from diarrhoea and general disturbances of nutrition at the time of the first dentition. There had been no other illness from that time to the event of the present disturbance.

J. attended school for one year, and "was slow to learn." He was always quiet and reserved. Syphilis and gonorrhoea are negative. Tobacco and intoxicants have been used to a very moderate extent. Patient has been a car window washer for the past two years, and he has worked steadily. The home surroundings are poor, but moral.

Present History (statement of the sister).—The patient has always been a good boy, a steady worker, and has attended church regularly. He was always reserved, avoiding strangers, as well as persons of the opposite sex.

The evenings were always spent at home with the family, and not upon the streets.

The first symptoms of mental disturbance noticed by the family were on February 28, 1907.* The man started to work at the usual hour, but returned at eight o'clock a. m. and stated that he wished to rest that day. When inquiry was made as to the reason he wished to rest he said he "did not expect to work every day of his life." Patient spent that day and the succeeding one in the seclusion of his room reading the Bible, but aside from this nothing was noticed in his behavior, or conversation, to indicate that his mental equilibrium was disturbed. At the supper table on the evening of March 1 he announced that he was going to "take Christianity to the church." When asked to explain he made no reply, but picked up a crucifix and went to a Catholic church in the neighborhood, where he asked the priest to baptize it. After returning home, he told the family that he was "the Son of God," but would not give any further information about himself, or what he had done when away from home that evening. The same night he was restless and did not sleep. On the following morning he complained that someone was whispering to him and telling him to do wicked things. Later in the day he became excited, proclaiming himself to be of divine origin. He then went to the Catholic church and assaulted the priest, who had him sent home. That night he showed much motor restlessness, was sleepless, could not be controlled, and on the following morning (March 4) was sent to the Detention Hospital.

On admission J. was loquacious and incoherent, but in a little while he became mute. Then again, after an interval of half an hour, he was gesticulating wildly, was incoherent and talkative, exhorting an imaginary audience, grimacing, assuming theatrical attitudes, jumping, crying, and swearing. Definite delusions could not be determined at this time. A few of the sentences spoken were: "Judge do your duty"; "let me go home"; "if you don't believe in me, you don't believe in God"; "won't you take this hand, gentlemen"? "I love you all"; "will you accept God"? "oh my God"; "holy saints"; "holy mother"; "holy disciples"; "holy angels"; and repetitions of the same character.

When admitted the patient was untidy and unkept, with clothing torn, and soiled with mud.

Physical Examination.—Skull regular, brachycephalic. Index 84. Circumference 56 cm. Nutrition only fair. Appetite poor. Actual disturbance of general sensation could not be definitely determined, though the sense of pain seemed to be dulled. Deep and superficial reflexes everywhere exalted. Mechanical muscular excitability much above normal. Pupils 3 mm., over-reactive. Psychoreaction positive. Tremor of tongue, fingers, and lips. Pulse 72, tension low. Slight arterio-sclerosis of the peripheral arteries. Heart sounds accentuated, especially the second aortic.

*The man after recovery stated that the mental indisposition began early in January, 1907.

Lungs negative. Lowered vaso-motor status, with cyanosis of all the extremities, and profuse sweating of the hands and feet. The skin is without eruptions, but moist and cool. There is marked dermatographia. No Romberg, von Graefe, Stellwag, or Babinski. Tongue coated and patient constipated. The thyroid gland is about the normal size, but soft and mushy to the finger. The neck looks rather full.

Urine.—Sp. gr. 1023. Color, amber, transparent; slight sediment on standing. The reaction is alkaline. No albumin, sugar, bile pigments, or indican. Skatol is noticeable as a faint trace. The sulphates as well as phosphates are increased. The microscopic examination showed uric acid crystals, triple phosphates, cylindroids, a few hyaline casts, also bladder epithelium.

Subsequent History.—March 20. The patient has been almost constantly mute since his admission. Is apathetic and indifferent, but is occasionally impulsive. Catatonic rigidity, with negativism, is well-marked. The reflexes and mechanical muscular excitability are far above normal. Dermatographia is well-defined. The skin is oily. The hands and feet are cyanotic and perspiring freely. The patient looks very anæmic and has lost considerable flesh since his admission. A blood count showed the erythrocytes to number 3,780,000; leucocytes 14,000; hemoglobin 78 per cent; small monos. 20.0 per cent; large 17.06 per cent; eosinophiles 3.30 per cent; neutrophiles 58.70 per cent; mastzellen .00.

March 27.—The patient is absolutely mute, negative and catatonic. The general condition is unchanged.

June 5.—J. has remained mute since the last note was written. The skin of the face is of an earthy tint and doughy. The other physical symptoms are unchanged, beyond that the tremor has increased. Pulse 80.

June 30.—The man has not improved at all since the last note was taken, and it was now decided to perform a partial thyroidectomy upon him.

July 1.—Examination preceeding the operation.

The patient has been completely mute for over three months, and no additional mental symptoms have been observed. He does not now resist handling. The iris reactions, to light and sympathetic stimuli, are over ready. The psycho reflex is present. There is no prominence of the eyeballs. Mechanical muscular excitability is much exaggerated, as are likewise the deep and superficial reflexes. Catatonic rigidity is present, but no negativism. Cutaneous sensations are, apparently, dulled. There is well-defined hyperidrosis with a lowered vaso-motor tone. A fine fibrillary tremor is noticeable about the lips and small muscles of the hands. The skin is pallid and doughy, especially about the face. The heart sounds are all accentuated, and especially is this true for the second pulmonic. The pulse remains at 80. Blood pressure 125 R. R. The thyroid gland is palpable, about the average in size, soft to the finger. The bridge can only be determined with difficulty. The neck over the thyroid gland measures 35.5 cm. There is no dullness over the site of the thymus gland. The testicles are firm. A blood examination showed, red cells 3,800,000;

white cells 10,800; hemaglobin 78 per cent; the differential count: small monos. 21 per cent; large monos. 15 per cent; eosinophiles 4.0 per cent; neutrophiles 60.0 per cent; mastzellen .0 per cent.

July 2.—Operation at 3.30 p. m. (Dr. Follis), under ether. About four-fifths of the right lobe of the thyroid gland was removed. The parathyroids were not injured. The portion removed weighed 4.95 grams, and measured in length 5 cm., in width 2 cm., and thickness 1 cm. The ether was not well borne.

Post Operative History.—The patient came out of the ether narcosis at 6.30 p. m. He was then restless and begged to sit up, as he said he was choking. By eight p. m. he was quiet and apparently sleeping. At 9 o'clock he was gasping and moaning. At 1 o'clock a. m. he was given one-fourth grain morphia by the syringe, and was then quiet until four o'clock a. m. He then asked the nurse "how I came here," and the name of the place; also if she was the Holy Mother. He then slept until 4 a. m. Then awoke and asked for a glass of water. When this was given him he remarked "that every one seemed to talk upside down"; also that he would rather be out working. He also asked what made him sick. He slept again from 4.30 until 5 o'clock a. m., then repeated the word "hell" several times, then asked the time. He then added that he did not like the people here, and would like to go home. P. 152 to 125; T. 98.8°; R. 40 to 30.

July 3.—The patient is drenched in perspiration this morning, and looks pale and anxious. Is not nauseated. The egg-nog and milk given him are taken freely. He rested all the afternoon, sleeping most of the time. He refused any solid nourishment, saying that his throat hurt him. Later in the evening he was very restless, constantly attempting to get out of bed. At 1 o'clock a. m. he was given a quarter grain of morphia, but continued to be restless until 3 a. m., after which he slept until 6 o'clock.

July 4.—When the patient awoke he tried to speak, but could not talk louder than a whisper. He is apparently very weak, and is perspiring profusely. He slept nearly all the morning, but would start out of sleep at the slightest noise. The wound is healing well. The reflexes are greatly exaggerated, muscular excitability is plus, as is likewise dermatographia. Negativism is absent. The patient is now completely mute. His mother saw him in the afternoon, but no attention was elicited by her presence or inquiries, except that when asked if he knew her he said "yes" in a whisper. At eight o'clock he was sleeping quietly, but awoke at half after eight, and so remained until half after 10 o'clock, when he was given a teaspoonful of paraldehyde. He then slept until early next morning. J. ate a good breakfast. When the wound was dressed it was found to be in good condition. P. 150 to 132; T. 102° to 97°; R. 30 to 24. Hyperidrosis profuse.

July 5.—J. awoke this morning and conversed freely and intelligently to his nurse. He particularly spoke of an empty feeling in the head and some cephalalgia, and said that he had been silent when addressed, be-

cause he could not decide upon a reply to questions. He also mentioned that he had seen imaginary people, but seemed to recognize that they were hallucinations. He added that at times queer ideas passed through his mind which he cannot comprehend, but thinks that these ideas are growing fewer since the operation. As the day advanced he again became mute, or occasionally spoke at random. The pupils are $2\frac{3}{4}$ mm. in diameter, equal, but are still too reactive. The dermatographia is not so pronounced. The activity of the reflexes is perceptibly decreased, though not normal. Muscular mechanical excitability has not decreased. The hands and feet are reddish and dry, but the face and neck are still perspiring freely. The skin of the face is not as doughy as before the operation. The heart sounds are accentuated, the pulse is irregular, the tension low, the rate 99 per minute. T. 96.6° to 97.8° ; R. 23. The man is recovering his appetite.

July 6.—The patient slept without hypnotics until four o'clock a. m., awoke complaining of pain in the throat, and only takes liquid food for fear of the pain. He asked the nurse if he was "Jesus," but seemed satisfied when told that he was not. Is still perspiring profusely. The hands are dry, somewhat cyanotic. Dermatographia is still decreasing. The reflexes and muscular excitability are, perhaps, a trifle lowered.

J. rested quietly during the morning, and in the afternoon was quite lucid. At times he spoke of his delusions and hallucinations, and recognized them as false. The patient speaks in a low whisper, but answers questions concisely. T. 100° to 98.6° ; P. 97; R. 22.

July 7.—The general condition is about the same. In the afternoon he conversed with his mother for a few minutes. There is continued hyperidrosis.

July 10.—The general condition is improving. The man is sitting up, reading part of the time. The perspiration is less excessive.

July 11.—The patient slept fairly well during the night, but complained of headache in the morning. A small abscess in the neck was evacuated, and the temperature, which had risen to 103.2° then dropped to 100.2° ; P. 97; R. 28.

July 12.—The man speaks coherently to-day, but is inclined to be quiet. The excessive perspiration is decreasing. T. 100° ; P. 95; R. 22.

July 14.—J. is sitting up to-day, and is composed, lucid, and cheerful. Hyperidrosis has ceased. The reflexes, muscular excitability, and dermatographia and considerably decreased. A few drops of pus are still coming from the abscess. T. 98.4° ; P. 95; R. 22.

July 17.—Since the last note was made the man has gained rapidly. He speaks connectedly and is very willing to do whatever is told him. He sleeps well at night, takes considerable interest in his surroundings, also spends a large part of his time in reading books. The memory, up to the time of his mental indisposition, is good. He complains of feeling weak and speaks considerably about himself, worrying about having been insane. He attributes his insanity to masturbation. At this date there are no mannerisms, no posing, stereotypy, negativism, or impulsiveness. Redden-

ing on irritation of the skin is now faint, and disappears quickly. The superficial reflexes are still exaggerated, the deep ones are normal. Mechanical muscular excitability has much decreased, though it is still above the normal. The pupils are 2.5 mm. equal, normally reactive to light and accommodation, as well as to sympathetic stimuli. The hands and feet and still somewhat cyanotic, cold, and clammy. The pulse is irregular, compressible, with low tension, 120 R. R., 95 beats to the minute. The heart sounds are accentuated. Lungs negative. Bowels regular, appetite good. The patient reads a good deal, and is bright and willing. There is no longer difficulty in holding a conversation. The neck wound is completely healed, and there is no enlargement of the remaining half of the thyroid gland.

July 23.—There is complaint to-day of difficulty in micturition, also of pain in the abdomen. On examination, there is evident infection of the prostate gland, as the result of catheterization during the first few days after the operation. Cystogen 5 grs. t. i. d. T. 101.2°; P. 96; R. 22.

July 30.—A slight subcutaneous hemorrhage, not of traumatic origin, has come over night under each eye. The prostate gland is considerably swollen. T. 99.2°; P. 95; R. 22.

August 5.—J. refused breakfast this morning, and complained of severe pain when the bowels were moved, also that he felt weak and giddy. The temperature has risen to 102.2°, but the sensorium is clear, and neither delusions or hallucinations have appeared. The prostate gland is beginning to show signs of pus formation. T. 103.2°; P. 97; R. 28.

August 8.—The prostatic abscess ruptured externally with relief of the pain and distress. T. 100°; P. 98; R. 28.

The pupils are normally reactive, 2 $\frac{2}{3}$ mm. Dermographia slight, reflexes slightly exaggerated. The patient is entirely oriented, coherent, and there has been no delirium. The neck over the thyroid gland is now 35 cm.

August 10 to 23.—The man is again steadily improving. Sleep is normal. He is in good spirits, converses pleasantly, and reads a good deal. The motor signs have markedly decreased; dermatographia is faint and disappears quickly. The reflexes are about normal, and mechanical muscular excitability has lessened. The hands are warm, though still clammy. The pupils are equal and normally reactive. There is still slight tremor of the hands and lips.

August 23 to 28.—There has been no change in the patient's condition, other than he is steadily growing stronger and mentally more capable. The memory is excellent.

Sept. 1 to 30.—J. has remained bright and cheerful to this date. He is in good spirits, assists in the work of the ward, and spends a good deal of his time out of doors. The motor symptoms are unchanged since the last examination. The patient was sent home on September 30.

October 8.—The patient reported for examination to-day. The mother says that he has shown no signs of abnormal mentalization, but has been somewhat inert. Sleeps well. Appetite good, memory excellent.

Pupils 2 mm., equal, the internal ocular reflexes normal. There is no protrusion of the eyeballs. Superficial and deep reflexes normal. Mechanical muscular excitability is slightly plus. The skin is warm and dry, and the hands and feet are no longer cyanosed. The vaso-motor state is normal. Dermographia is faint. The general nutrition is excellent, and the man is gaining rapidly in weight. There is no tremor. The neck, over the thyroid, measures 35.5 cm. Apparently there is no hyperplasia of the left half of the gland. Pulse 74. Blood pressure 150 R. R. The accentuation of the heart sounds has decreased. Testicles firm. Splenic dullness 6 cm. No dullness over the thymus gland.

November 8.—The patient has been working at his occupation for several weeks. He is now normal in every respect.

December 20.—J. reported to the hospital for examination. He has been working steadily for about two months, and has been regular and attentive to his duties. He has gained remarkably in flesh, and now weighs 25 pounds more than when he left the hospital. His muscles are full and well-nourished; he looks extremely well, and the face has a more open and intelligent expression. The physical signs of catatonia are negative, except that mechanical muscular irritability is still above the normal. The memory is good, and response to questions is quick and comprehensive.

April 8, 1908.—J. continues to be normal.

October, 1908.—Patient continues in good health.

MICROSCOPIC EXAMINATION (DR. MCCALLUM).

Thyroid.—The thyroid is rather fibrous-looking; strands of connective tissue subdivide it into lobules. The alveoli are for the most part large but very irregular in form with buds and infoldings. The epithelium is cubical, distinctly higher than normal, but not as high as that seen in exophthalmic goitre. There are numerous small alveoli associated with these larger ones, and these also have high epithelium. There are some scattered patches of lymphoid tissue through the thyroid.

BLOOD EXAMINATIONS.—JOHN Y.

Date.	Red cells.	White cells.	Hemoglobin.	Small monos.	Large monos.	Eosin.	Polyns.	Masts.	Trans.
March 20, 1907.....	3,800,000	15,000	78%	20.0%	15.0%	4.0%	60.5%	.5%	..
April 6.....	3,820,000	13,000	79	22.0	16.0	3.5	58.5	.5	..
" 30.....	3,750,000	10,000	76	23.0	15.0	3.0	60.0	.0	..
May 6.....	3,780,000	11,000	77	23.0	16.0	4.0	57.0	.0	..
" 18.....	3,800,000	10,800	78	21.0	15.0	4.0	60.0	.0	..
July 28.....	4,000,000	10,000	75	22.0	1.5	1.0	73.0	.5	1.5%
Aug. 12.....	5,450,000	18,600	70	22.0	2.0	1.5	71.0	1.0	1.0
" 19.....	5,600,000	15,000	70	24.0	4.0	2.0	70.0	1.0	2.0
" 26.....	6,000,000	9,400	70	21.5	3.0	1.5	72.5	1.0	1.0
Sept. 2.....	5,500,000	10,300	75	22.0	2.0	3.0	71.0	1.0	1.0
" 11.....	5,600,000	10,600	80	20.0	2.0	2.0	75.0	.0	1.0
" 25.....	5,700,000	9,500	75	21.0	3.0	2.0	73.0	.0	.0

Blood pressure: July, 120 to 140; August, 135 to 140; September, 140 (R. R.).

CASE III.—Julia A., a negress, aged 28 years, a domestic servant, was admitted to the Detention Hospital, September 20, 1907. Diagnosis, catatonia.

Family History.—This was negative as to mental troubles, beyond that a maternal aunt suffered with epilepsy. The father died at the age of seventy-five years of some renal malady, the mother at sixty-four of pulmonary tuberculosis. The patient is a younger member of a family of twelve, four dying in infancy. The others are living and in good health. J. was never regarded, by her relatives, as bright.

Past History.—The birth was without instrumental aid. During childhood she suffered from pertussis and measles. At the age of ten years the patient developed attacks of vertigo, in which she would fall, but would not lose consciousness. These attacks occurred both diurnally and nocturnally. Five years later she began having convulsions at night with entire loss of consciousness, the seizures lasting as long as fifteen minutes. The epileptic attacks ceased at the age of twenty-five years.

The menses first appeared at the age of sixteen, and were sometimes irregular and sometimes profuse. Intense headache occasionally occurred at the time of the periods. J. attended school for only eight months, but in that time learned to read. She worked at housework in her own home until she was twenty-five years old; then hired out as a children's nurse. Alcohol, syphilis, drugs, are denied, and signs of luetic trouble are negative.

Present Trouble (sister's statement).—During the month of July, 1907, J. began to grow listless, inclined to be stupid, and was given to silly laughter without apparent cause. About the first of August she began to leave home and wander about the streets, and when questioned by her sister, as to her object in these aimless wanderings, would give no answer. After being well scolded by the family about her habits, she discontinued them, but became restless and impulsive. Later she would get out of bed during the night and break the panes of the windows, or would do other equally senseless acts. Within two weeks after this she became non-reactive to external stimuli, and mute to questions addressed to her. At a still later stage the muscles became spastic, and she became resistive to ordinary attention.

On admission to the Detention Hospital, September 20, 1907, the patient would not reply to questions, was negative, catatonic, and sat with her head fixed on her breast, staring at the floor for hours.

Physical Examination.—Skull dolichocephalic, cephalic index 79.4. Circumference 57 cm. The eyes are without intelligent expression, the face mask-like. The pupils are dilated but equal. The skin is oily. The face looks full. The posterior portion of the scalp is doughy to the feel and thickened, a condition that is also present in the skin of the cheeks. The hard palate is high-arched. The pharynx and tonsils are natural. The breath is foul and there is pronounced constipation. A trivial papular eruption is present on the chest. The mammary glands are shrunken. From the condition of the abdominal walls, the woman has borne children. The general nutrition is fair; the weight 120 lbs.

The peripheral arteries are slightly thickened. P. 70; R. 20; B. P. 115 R. R. Examination of the thorax is negative, except that the second aortic sound is accentuated. The neck over the thyroid gland measures 30 cm. The gland is palpable, about the natural size, but soft to the finger. The bridge can only be made out with difficulty. There is no thymus dullness. The spleen is of normal size.

The motor signs are well-marked. Dermographia is positive, as is also mechanical muscular excitability. The deep and superficial reflexes are exalted. The pupils are over-reactive to light, to sympathetic and consensual reaction, while the psycho-reaction is present. The pupils vary from 2 to 3 mm. in moderately strong light. The hands and feet are cold and clammy, but there is no general hyperidrosis. The vaso-motor tone is low. There is a well-defined fibrillary tremor of the hands and tongue.

The girl has been entirely mute since her admission, has shown no impulsiveness, but is apathetic, catatonic, and negative. If placed in one position she will retain it for hours. The patient is very untidy, passing urine and feces in her clothing.

A number of urinary examinations gave, sp. gr. 1025. Indican and skatol are in excess and cylindroids are present, but the examination was otherwise negative.

The patient was ordered 15 grs. potassium iodide thrice daily, but this was discontinued at the end of ten days, and hyperalimentation was ordered.

September 22.—The girl is steadily losing weight. She was ordered to be kept in bed in the hospital ward. There she spent her time staring at the ceiling, never addressing anyone, or asking for food or water. When the woman is spoken to or shaken there is no change in the mask-like expression, but if an attempt be made to open the mouth, or change the position of a limb, resistance is immediately encountered. The increased reflexes, muscular hyperexcitability, as well as the other motor symptoms, remain unchanged. Tactile sensibility is apparently normal. The pupils remain over-reactive. The appetite continues good, and artificial feeding is unnecessary. The total amount of urine passed is quite small.

On Oct. 2, 5 grs. of desiccated thyroid, thrice daily, was ordered. No improvement was noted, but the contrary, the woman becoming more untidy, and showed increased negativism when attempts were made to handle her. The thyroid was abandoned on October 14. No further change in the patient, up to October 31, was noted, beyond that she continued to lose weight, and occasionally made an impulsive movement. A partial thyroidectomy was now advised.

November 2.—The operation was begun at 3.30 o'clock, and about four-fifths of the right lobe was removed under ether (by Dr. Follis). Neither of the parathyroid bodies were injured, and the vessels were carefully spared. On the table the muscular rigidity was well-marked, but soon relaxed under ether. At the beginning of the etherization the woman struggled for air, and then became unconscious. The removed portion of the gland was dark in color from congestion.

Post Operative History.—J. came out from the anesthetic slowly, was much nauseated, vomiting repeatedly. At 6 o'clock she spoke to the nurse, slowly, coherently, and distinctly, the first words she had uttered since her admission. Afterwards, the patient became restless, the pulse weak, and strychnia and morphia had to be administered. At a later hour J. became excited and very difficult to control. The pulse again grew weak and rapid, 160 beats to the minute. The T. rose to 102° and the R. to 28. Some serum was expressed from the wound, after which she became quieter, and the pulse lower.

November 3 and 4.—There has been continued excitement, with constant loud talking, interrupted, at frequent intervals, by attempts to strike the attending nurse. The patient at all times has been most difficult to control. T. 100.8°; P. 130; R. 22. The pulse dropped to 110 beats after the expression of about a dram of clear serum from the incision, and shortly thereafter fell to 90 beats. The wound is healing nicely.

There is profuse sweating. The face is bloated and puffy. The woman now replies coherently to simple questions, and without any considerable hesitation. Menstruation has begun, for the first time since her admission to the institution.

November 8.—The woman is now up and about her room. The wound has practically healed. She speaks a little voluntarily, but her replies are coherent. Delusions or hallucinations have not been noted for some days, the excitement of the past few days having now subsided. The patient now notices closely what is transpiring around her, and has become cleanly in her habits. She voluntarily looks after her own room, and to the making of her bed. Weight 105 lbs. T. normal; P. 90; tension fair.

The motor symptoms have not perceptibly decreased, except that negativism is absent, and muscular rigidity is subsiding. The face is less puffy. The pupils are 2 mm., not so reactive to stimuli.

November 12.—Patient has been very well conducted since the last note was taken. She has conversed a number of times with her relatives, and intelligently. She does not tire readily and become incoherent. She has shown no signs of delusions or hallucinations, and takes considerable interest in the other patients. Dermographia is slight. The reflexes and mechanical muscular excitability are decreasing. The pulse is fuller, 80 to the minute.

November 16.—The patient has continued to do well. She is easily interested, but does not speak much. The muscular tremor has ceased. The other motor symptoms are abating.

November 17.—A change began to-day in J.'s condition. She is now apathetic and negative, besides showing some muscular rigidity. She is also untidy, mute, and shirks her work. The motor signs are also on the increase. The temperature has risen to 101°, and the pulse is also rising. The wound, which had almost healed, was irrigated.

November 18.—The woman's mental state is the same as yesterday. She is mute, catatonic, untidy, and non-reactive to stimuli. T. 101°; P. 145.

The left half of the thyroid gland is swollen, otherwise there is nothing to account for the change in the patient's condition.

November 19.—The general condition is unchanged from yesterday, beyond that the temperature is down to 99°, and the pulse to 110 beats.

November 22.—To-day signs of improvement are manifest.

November 23.—The improvement is progressive. The patient has again become tidy in her habits, and resumed the care of her room. She speaks a little, and is no longer catatonic or negative. The other motor signs have not decreased.

November 25.—The improvement is steady and continuous from day to day.

December 1.—The woman attends to cleaning her room, making her bed, and other small duties. She speaks coherently and clearly, though only when addressed. She is also gaining rapidly in weight. Muscular rigidity and negativism are absent. Dermographia has considerably decreased. The reflexes and muscular excitability are above normal, though again decreasing. T. from 98° to 98.6°; P. 89; B. P. 125 R. R.

December 2.—The improvement during the past few days has been so decided that she was allowed to go home on parole, and to-day her sister took her away with instructions to report progress every few days. The deep reflexes and muscular excitability are above normal. J. is absolutely clear in her replies to questions, speaks but little, and is industrious.

December 9.—J. has been bright, industrious, and cheerful, since her return home. She has attended to the cooking and other household work, and has done it well. Curiously, the family consider the woman as mentally more active than she has been at any time in her life.

December 28.—J.'s condition remains unchanged.

January 20.—There has been no relapse to this date.

February 28.—J. continues normal.

July 20.—The woman continues in good mental health.

HISTOLOGICAL REPORT (DR. MCCALLUM).

Julia H. Catatonia. November 2, 1907. 4/5 right thyroid. Removed 4.15 p. m. Received 6 p. m.

A part of the gland seems a little firmer than the rest and is more translucent. The gland in general is almost normal looking; it is reddish-gray and quite homogeneous. On section, rather translucent, with scattered points of yellowish opacity, which are visible only on most careful inspection. No distinct parathyroids seen. The mass weighs a little less than 7 gm. The portion dried weighs, now, when moist 5.03 gm.

PATHOLOGICAL LABORATORY, December 1, 1907.

Report on the iodine content of thyroid gland of Julia H., Bay View:

November 2, 1907.—Weight of dried thyroid 1.55 gm. Crucible negative. Gland treated with 3 gr. sodium hydroxide and ashed. Mass then treated with 3 gr. potassium nitrate and heated to whiteness. Taken up in water,

filtered, and diluted to 50 cc. 45 cc., or nine-tenths of total amount taken for test, was neutralized with 20 per cent sulphuric acid and treated with 5 cc. of chloroform. On shaking, an *intense* red color was obtained.

A standard was made up in the usual way and it required 20 cc. of the potassium iodide (1-5000) to match the color.

Now since 1 cc. is equal to .0002 gr. of potassium iodide, in the *entire* amount we found .00444 gr. of potassium, or .00342 gr. of iodine.

MICROSCOPICAL NOTES.

Thyroid.—Is composed of uniform, rather small alveoli usually rounded in form and showing no infolding of epithelium. The alveoli are lined with a flattened epithelium which is perfectly uniform and normal-looking throughout. The blood vessels show some evidences of calcification and hyaline degeneration in their media.

Except for the fact that the patient was somewhat older than is customary for the beginning of a catatonia, Case III offered the ordinary physical and mental signs of the malady, of fairly severe form. The intense excitement following the partial lobectomy was probably due to the use of too small a drain, and the woman suffered in consequence from the toxæmia of absorption of the thyroid secretion into the general circulation, with rapid pulse and general weakness. The recovery was uninterrupted until the usual time for hypertrophy of the remaining portions of the thyroid gland to occur, when there was an almost complete relapse, with a slow upward movement afterwards.

The blood examinations in this instance differed materially from a number of others, both those referred to in these pages, and unrecorded. The leucocytosis up to date of the thyroidectomy was not up to the average for catatonia; the increase after the operation was fair, but at the date of the last examination it was considerably higher than it should have been. Also the differential count at the time of discharge of the patient from the hospital showed that the blood had not then returned to a normal condition. Nevertheless there has been no relapse.

BLOOD EXAMINATIONS.—JULIA H.

Date.	Red cells.	White cells.	Hemoglobin.	Small monos.	Large monos.	Polys.	Eosin.	Trans.	Mastz.	Blood press. (R. R.)
Oct. 2, 1907*.....	4,600,000	8,400	80%	27.0%	3.0%	67.0%	1.0%	1.0%	1.0%	155
" 4.....	4,300,000	9,200	80	30.0	2.0	65.0	1.0	2.0	.0	125
" 7.....	4,500,000	9,000	80	27.0	2.5	68.0	2.0	.5	.0	130
" 17.....	4,600,000	6,600	75	28.0	2.0	67.0	1.0	1.0	1.0	115
" 25.....	5,500,000	10,600	75	25.0	2.4	69.5	4.6	1.5	.0	130
" 30.....	5,200,000	9,800	75	24.4	4.2	66.8	1.6	2.8	.0	120
Nov. 1.....	4,700,000	16,000	75	36.0	4.5	57.0	1.5	1.0	.0	..
" 6.....	4,200,000	11,200	..	33.0	4.5	59.0	1.0	2.0	.0	..
" 16.....	3,950,000	7,800	70	31.5	5.0	59.5	2.0	0.0	.0	115
" 26.....	4,300,000	13,200	75	33.0	4.0	59.0	3.0	1.0	.0	125
Dec. 2.....	.....	.....	..	38.0	2.0	58.0	1.0	1.0	.0	..

* Patient mute, taking little fluid.

CASE IV.—Albert A., æt. 19 years, a native of Maryland, a factory hand by occupation, was admitted to the Detention Hospital, May 25, 1907. Diagnosis, catatonia.

Family History.—There has been no psychosis of any description on either the father's or mother's side of the family. The father is living, 45 years of age, and is of a somewhat neurasthenic disposition. The mother is also living, aged 39, and is healthy. The other member of the family, a sister, two years older than the patient, is intelligent and also physically healthy.

Past History.—A.'s birth was without instrumental aid. He had measles, whooping cough, also mumps, during childhood, but there has been no more recent illness up to the beginning of the present malady. A. attended the public schools for eight years, and reached the 7th grade in the primary department, indicating that he was less than ordinarily intelligent. The boy has usually been of a cheerful disposition. Gonorrhœa, syphilis, and the abuse of alcohol are denied, and signs are negative.

Present History (father's statement).—On March 1, 1907, A. came home from his work complaining of a sore throat, and remained in the house for two days, by which time the throat was well; he then returned to his occupation. A week later the throat again troubled him; he came home, went to bed, and remained there for several days. The cold soon improved, but the boy continued in bed until the middle of May. The father noticed no mental symptoms, beyond that his son was unusually quiet, until about the first of May, when he began to talk at random and was extremely slow in answering questions. A week later he became excited, swore roundly at every one who came near him, and afterwards would burst into paroxysms of silly laughter, often without apparent cause. If he was refused anything for which he asked, he would have "jerky spasms" and the back would become arched. A few days later he became impulsive, then sleepless, then mute. At times the mutism would be broken by a meaningless jargon. The appetite fell off, and at intervals all food was refused. He then became degraded, untidy, and on May 25, was sent to the Detention Hospital.

On admission he would not reply to questions, was apathetic, at times given to outbreaks of foolish laughter, and was untidy in his personal habits.

Physical Examination (April 26).—Skull brachycephalic, circumference 52 cm., index 82.8. The bowels are constipated, the tongue furred. The man is somewhat emaciated, and weighs 120 lbs. The special senses are, apparently, normal. The pain sense is dulled. The deep and superficial reflexes are greatly exaggerated, as is mechanical muscular excitability. There is a fine tremor of the hands; lips and eyelids, but in the tongue it is particularly noticeable. The pupils are 2 mm. hyper-reactive to light, consensual and sympathetic stimuli. The psycho-reaction is present. Dermographia is well-defined. There is pigmentation of the skin over considerable areas, especially pronounced over the lower region of the back. The peripheral circulation is sluggish, and the hands and feet are cyanotic, cold, and

clammy. The general circulation is also slack. The heart sounds are negative, beyond that the second aortic and second pulmonary are accentuated. The lungs, testes, spleen, and area of thymus dullness are natural. The thyroid gland is small, as well as soft to the finger.

Subsequent History (June 18).—A. has remained entirely mute, catatonic, negative, as well as untidy in his habits since his admission. Dermographia remains very well-marked, as is also the excitability of the deep and superficial reflexes. Mechanical muscular excitability is far above the normal, the slightest tap of the pleximeter eliciting waves of contraction that pass into a tonic cramp of the muscular strands, or there may be a succession of muscular contractions. The spasms are most readily elicited in the muscles of the thenar eminences, or in the pectoral muscles. The tremor of the muscles of the head and hands continues. At times there are spasmodic jerkings of the head to one side. The emaciation is now extreme, and the weight has fallen to 100 lbs., and this despite enforced feeding. The skin from the waist to the mid-thighs has become deeply pigmented, reminding one of Addison's disease, but there are no tubercle bacilli discoverable in the secretions.

The extremities are cold, clammy, and covered with a disagreeable sweat. There is no swelling or boggiess about the face. The hair on the face is scanty, that on the pubes well-developed.

The pupils are 2 mm. in diameter, equal, and hyper-reactive to light, accommodation, as well as the psycho-reaction.

The thyroid gland is not changed; thymus, spleen, testes, and lungs are natural. The heart sounds are unchanged. P. 90; B. P. 120 R. R. Leucocytosis 11,000.

During the summer the patient remained in the same state, except that he could be aroused out of the stupor sufficiently to smile and utter a few disconnected words. The facies is entirely devoid of expression. The man has gained somewhat in flesh. He has been kept out of doors the major part of the time; has been given an especial diet, on which he has gained five pounds, and has been carefully looked after. The pigmentation of the skin gradually disappeared.

November 2.—An examination to-day showed the mental and physical conditions to be practically unchanged, except that he has lost four pounds in weight. There are now impulsive movements, apparently, the outcome of delusions. Rigidity and negativism are marked. The man now smiles when spoken to, and occasionally there are paroxysms of meaningless laughter, lasting as long as a quarter hour. Unless compelled to go out of doors he will lie the entire day flat on his back, the face expressionless, the hands clinched, and the gaze fixed upon the ceiling. Rarely there are a few coherent words, then a lapse into mutism. A. is apparently beginning to dement.

As there seemed no possible chance for a recovery, a partial thyroidec-tomy was determined upon.

November 8.—Operation at 3.30 p. m. (Dr. Follis). Removal of 2.96 gm. of the right half of the thyroid gland. The organ, when exposed, was

small, congested, but otherwise normal. The upper parathyroid body was slightly wounded during the operation. There was considerable struggling, but no cries when the ether was administered. A. came out from the anesthetic at 5.20 p. m., groaned, and said, "Oh my God," and when asked whether his neck hurt him, replied, "yes." An hour later he cried out, "oh, it is coming"; then, "oh, its all over, and it's a little girl," evidently believing that he was in the pangs of labor. Later in the evening he became very resistive, and the nurse was obliged to confine his hands in muffs. T. 100°; P. 98; R. 20. By eleven o'clock he had quieted down, and slept until 4 a. m., when he awoke and asked for a glass of water.

November 9.—This morning A. has voluntarily spoken a good deal, usually about a number of delusional ideas. At times he swears or hums tunes to himself. Later in the day he became more coherent, as well as more readily managed, though he is still abusive. The patient no longer voids urine in the bed, but calls for the urinal. P. 100, feeble; T. 99.8°; R. 20. In the afternoon A.'s mental state varied considerably. Sometimes he would weep, then would sing a mixture of ribald songs and ordinary hymns. He complains constantly of the pain in his neck, and seems to have the idea that he is being tortured. Ice bags were for a time applied to the neck, but he became very restless, and they were finally removed, the ice being given, instead, by the mouth, which seemed to be grateful. During the rest of the afternoon the patient constantly spoke of delusions distressing him, the rambling talk being alternated with loud shouting and singing.

The hands and feet are perspiring freely. The motor signs are unchanged. The man slept fairly comfortably during the night. T. 100°; P. 98; R. 20. A fair amount of liquid nourishment has been taken during the day. The leucocytosis is 18,000.

November 10.—The cold applications to the throat were renewed this morning, but gave the patient a great deal of discomfort. He asked the nurse to read to him; also told her that he "hated the doctors." While the psyche is clearer than before the operation, there is still a great deal of mental confusion, and at times silly laughter and loud singing. When the incision was dressed to-day, it was found to be in good condition. In the late afternoon A. talked to his father coherently for a few minutes. T. 100°; P. 120.

This evening the patient had a spasm of the throat muscles, which was relieved by crushed ice. The man became cyanosed, and broke out in a profuse perspiration. After this he was restless and several times started to get out of bed. At 8 o'clock there was a second spasm of the throat, followed by cyanosis of the face and profuse perspiration. Parathyroid extract was now given. He slept restlessly all night.

November 11.—At 8 o'clock this morning the man was stuporous. A few minutes later he jumped out of bed with a start, and appeared to be choking, after which the breath came with a long sighing inspiration. The face and extremities became cyanotic, and a profuse sweat followed. P. 130 to 97; T. 100° to 99.2°.

A half-hour later he was entirely over the attack, and was eating his

breakfast. The parathyroid was continued, 1/10 gr. every four hours. The wound was also dressed, and found to be doing nicely. A. rested quietly during the day, but at 6 o'clock p. m. there was another laryngeal spasm. This seizure was light in comparison with those preceding it.

There has been no improvement in the mental condition during the day. If questioned the man answers "yes, yes" to everything. Patient is perspiring profusely. The saliva is retained in the mouth, making breathing difficult at times. He was very restless until 8.30 p. m., when he fell asleep, and had a fairly comfortable night. Evening: T. 100°; P. 130; R. 23.

November 11.—A. conversed with his parents to-day for a full half-hour and was coherent, though slow in speech. Reflexes, dermatographia, and muscular excitability unchanged. The hyperidrosis continues. Leucocytes 23,000. T. 100° to 99.4°; P. 98.

November 12.—The patient has to-day manifested considerable interest in his surroundings, and has asked the nurse a number of questions about her life, especially how she liked nursing. He also conversed with his mother for some minutes, though it took considerable urging on her part to make him speak. There is marked hyperidrosis. No change whatever in the motor symptoms. The wound continues to heal. T. 99°; P. 89; R. 20.

November 13.—Last night there was a good deal of rambling talk during sleep. This morning A. is inclined to be anxious and mute. From his actions it is evident that some hallucination is troubling him, as he points to a spot on the wall, and his face assumes a distressed expression. He would not speak to his mother this afternoon. The appetite and digestion continue good.

November 14.—A. slept well last night, but is mute this morning. The eyes, however, follow the nurse about the room. Later in the day he spoke a little, and said he wished to go home. T. 98.6°; P. 90.

November 15.—In the morning the patient laughed to himself in a silly way, but in the afternoon he talked sensibly to his mother for a few minutes.

November 16.—A. awoke this morning, after a sound night's sleep, but is inclined to be mute. However, when urged to answer questions, he does so slowly and collectedly. He has again commenced to take some interest in his surroundings, and observes whatever is transpiring around him. The appetite is ravenous. The dermatographia is fainter, but the pupillary and other reflexes are much too active. There is no rigidity or negativism. Delusions or hallucinations have not yet been noticed during the past two days. Leucocytosis 15,000. T. normal; P. 85 to 90. The wound is completely healed.

November 19.—No further change in the man's condition can be noted. He speaks slowly, coherently, and connectedly when he is questioned, but volunteers nothing. He eats and sleeps well, and is increasing in weight at a rapid rate.

November 21.—A. is to-day cross and disagreeable, but will give no reason for the change in disposition. He is more restless than ordinary

When his mother came to see him he talked with her coherently for some minutes.

November 23.—The patient to-day is allowed the liberty of his room, but will do no work and stands at the window gazing out at the prospect.

November 25.—Is to-day very restless and disinclined to speak, however, he told his father that he wished to go home. The pulse has risen to 120 beats, and the temperature to 99.2° , without any other apparent cause than a slight swelling of the remaining half of the thyroid gland. The weight is now 106 lbs.

November 26.—The patient has voluntarily spoken more to-day than on any day since he has been in the infirmary. He is mischievous and teasing. He talked with his mother for some minutes, and seemed quite pleased to see her. He is still perspiring freely. The motor symptoms have not materially changed, though the extremities are not cyanosed. The leucocytosis is still high. Appetite and digestion continue good. T. 98.6° ; P. 87 to 100.

November 27.—The man continues to progress fairly well, speaking coherently and rationally. Temperature and pulse are fractionally higher than yesterday.

November 28.—A. is again mute this morning, and his attention cannot be elicited. Some phlegm accumulated in his throat, when he became excited and had a choking spell. He then wept for some minutes. T. 99.6° ; P. 90 to 110.

November 30.—A. tore the bandage off his throat this morning, and seemed quite disoriented. Later in the day the constant humming of tunes began, but to questions he is mute, or only answers, "yes, yes."

December 1.—The man is quite restless this day, and only answers the "yes, yes" to questions. If the nurse is absent from the room for a moment, he is always found standing at the window. The man takes no interest in anything, and sometimes steals spoons and hides them under the mattress.

December 3.—The patient is brighter to-day, and most anxious to go home. He is also more readily amused for the past few days.

December 9.—A.'s condition has remained unchanged since the last note was taken. The motor and mental conditions have not changed, with the exception that hyperidrosis has decreased. T. normal; P. varies between 82 and 96. To-day he was sent home with the hope that a change of surroundings would bring an improvement.

January 10, 1908.—A.'s parents find that it is impossible to keep him at home, as he has been mute most of the time, inert, and would do nothing in the way of work. He is now markedly negative. The reflexes and mechanical muscular excitability have perceptibly increased. Dermographia is negative except for pilo-cutaneous ridging when the finger nail is drawn over the skin. The pupils are 3 mm., hyper-reactive.

The man replies to questions in monosyllables, and then only after urging. He is apparently rapidly dementing, although, when his room-mate takes him out of doors, he will play ball with some slight show of interest.

January 17.—As but a small portion of the thyroid gland was removed at the first operation, less than in any other case, it is determined to see what effect the removal of a larger portion would have upon his mental and motor condition. To-day a second partial thyroidectomy was performed (by Dr. Follis), and 3.50 grm. of the left half of the gland was ablated. The neck lymphatics had become somewhat enlarged since the previous operation. The patient spoke a little while he was being prepared for the table, but was entirely apathetic and showed slight muscular rigidity.

January 20.—No reaction of moment followed this operation, nor did the man brighten up immediately. He always submitted quietly to having the wound dressed.

January 26.—For the past three days, A. has been fairly coherent, is dressed and about his room. He talks a little to the attendant nurse, and that coherently, but will not speak at all to the physicians.

Pupils 3 mm., reactive, equal. Dermographia is again quite marked, and cutis anserina is elicited by the slightest stroking of the finger. It comes out as a wave-like flash and quickly disappears. Mechanical muscular excitability is well-marked in the pectoral muscles, but has diminished in the forearms and thenar eminences. Reflexes exalted.

January 28.—The patient to-day asked the nurse to take the muffs off his hands, voluntarily saying that he would not disturb the bandages on his neck. The wound is almost healed. He kept the promise.

February 3.—The patient seems brighter than usual, and spoke coherently for a part of the morning. When asked how he felt, he replied, "all right, how are you?" The general condition is good, the appetite is fair, and the man is gaining in flesh, now weighing 120 lbs. Leucocytosis 13,600.

February 10.—The man's condition is unaltered. He is coherent but inert, and no delusions or hallucinations have been noted for several weeks.

February 17.—The weight is still increasing, but the intellectual gain is nothing, or even a falling off, as he now replies to questions at random, and sometimes not at all.

March 13.—During the past three weeks the man has gained greatly. He is now able to reason coherently, and holds a conversation without apparent fatigue. One week ago he was sent home, and has continued to improve, taking quite an interest in his surroundings. The parents report that he is in about his normal condition. The following letter gives a fairly accurate idea of his present state, and is the first one he has written for more than a year.

BALTO., MD., March 16, '08.

Dr. Philips.

DEAR SIR.—It affords me great pleasure to sit down today and drop you a few lines. I have improved very much. Thank you very much for your kindness toward me when I was a patient in your care.

Respectfully yours,

ALBERT A. . . . ,

709 35th Street.

April 7.—The patient continues to improve. The father reports that he is active both mentally and physically. The weight is now 134 lbs., a gain of 34 pounds from the lowest point.

April 14.—A. reported to the hospital to-day. He speaks freely, intelligently, and sustains a prolonged conversation without apparent effort. With the exception of slight mechanical muscular excitability, the motor symptoms have all abated, and to all appearances the man is quite normal.

May 12.—There has been no change to date.

July 20.—The man has not relapsed, but has continued in a normal condition.

September 27.—There has been no return of the mental indisposition.

The following is Dr. McCallum's report as to the microscopic examination and iodine content of the removed portion of the gland:

Albert A. Catatonia. Portion of right thyroid removed, weighing 2.96 gm. Small mass of soft tissue, homogeneous and uniform in appearance throughout. On cut surface the tissue is moist and glutinous, grayish-red. No apparent excess of fibrous tissue; no nodules. No parathyroids seen. 2.1 gm. of the thyroid preserved for drying and estimation of iodine.

MICROSCOPICAL NOTES.

Thyroid.—Is composed of alveoli of moderate size, very round and smooth in outline and of fairly uniform size. They contain a good deal of homogeneous colloid. The alveoli are lined with flattened epithelium which is entirely uniform in character. The connective tissue forms some quite coarse bundles throughout the gland, which carry abundant blood vessels, but on the whole it does not seem to be markedly increased in amount. There is no unfolding of the epithelial layer.

Iodine Content.—Weight of dried gland .7 gm. Crucible negative. 11.7 cc. of 1 to 5000 solution of potassium iodide required to match the color of the gland solution. Amount of KI. present .00234 gm. Amount of iodine present .0017784 gm.

Second Ablation, January 17, 1908.—Weight of thyroid tissue 3.46 gm. The specimen was hardened in alcohol.

Microscopically the alveoli are distended with colloid which is thin and pale, staining sometimes lilac, sometimes pink. The alveolar walls are thin and the epithelium is low and flat. The alveoli in general are larger than in the first specimen. Some of them are surrounded by small columns of other alveoli of smaller size, but there is no direct evidence of infolding of the epithelium. The connective tissue is abundant.

From the standpoint of the mental symptoms, Case IV showed few variations from the ordinary type of severe catatonia. Among the physical ones the extensive areas of bronzing of the back thigh and flank were much more pronounced than is often seen. This bronzing almost completely disappeared during the summer and did not recur when the weather

became colder. When the first partial lobectomy was performed, the case was, to all appearances, hopeless, as the brand marks of a dementia with profound cachexia had begun, and accordingly we were not surprised at the small amount of improvement that followed the operation, but, rather, on the other hand, were encouraged by the partial improvement in the mental processes that followed the period of customary initial reaction. It is to be noted that a gain in weight began shortly after the partial section, though the diet was little changed from what it had been before, apparently showing that a reduction in the quantity of the thyroid hormone thrown into the general circulation was productive of increased metabolism. So far as possible the conditions were the same both before and after the section, as to food and attention, the man on both occasions being in bed.

For a considerable time after the second lobectomy, about two-thirds of the left half of the gland now being removed, there was no mental improvement, only a steady gain in weight, and only after the man had reached, approximately, his normal weight did the mental attainments rise to anything approaching their normal level.

BLOOD EXAMINATIONS.—ALBERT A.

Date.	Red cells.	White cells.	Hemoglobin.	Small monos.	Large monos.	Polys.	Eosin.	Trans.	Mastz.	Blood press. (R. R.)
Oct. 22, 1907.....	5,700,000	11,200	75%	21.8%	3.0%	72.2%	1.6%	1.4%	.0%	120
" 30.....	5,850,007	10,200	75	24.0	2.6	69.4	2.5	1.0	.5	120
Nov. 1.....	5,550,000	11,800	..	26.0	4.0	66.0	1.4	2.6	.0	120
" 6.....	5,100,000	16,200	..	19.5	3.0	75.0	1.5	1.0	.0	115
" 9.....	5,900,000	18,000	75	25.0	2.0	71.0	2.0	1.0	.0	115
Jan. 20, 1908.....	5,450,000	15,600	75	23.0	3.0	70.0	1.0	3.0	.0	..
Feb. 4.....	5,200,000	13,600	..	27.0	3.0	67.0	1.0	2.0	.0	115

Contrasted with all previous results in the treatment of catatonia, the preceding serial four cases seem most remarkable in that they should all have recovered their mentality and that none of them should have relapsed within a period of months. Equally remarkable is the manner of recovery, in two the restoration of the mental powers was within a few days, while with others a number of weeks elapsed before there was a return of any degree of mental vigor. With the one exception all of them did well up to the time of the beginning of hypertrophy of the remaining half of the gland, and then there came mental recessions, and thereafter a varying return to health.

The results were so remarkable that we considered them too good to be true, and there was the possibility that we had chanced upon exceptional cases. The cases, though in the Public Deten-

tion Hospital, were given more attention than had they been private patients; they were assigned a faithful nurse especially versed in the management of such cases, and whose attention was unfailing, they were fed both before and after the operation with large supplies of nourishing and easily digested food, and a portion of the favorable result must be attributed to these accessory causes.

The available material within the walls of the Detention Hospital being exhausted, we asked permission of the Medical Superintendent of the Second Maryland State Asylum to examine the catatonic patients in his institution, to determine if a few patients suitable for the operation could not be selected from among the large material there.

About 40 persons in various stages of the malady were examined, and from these three were chosen, two women and a man. None of these cases were early ones; in fact, all were of greater duration than those previously lobectomized.

In none of the three cases did permanent results follow. For a few days after the operation there was increased reaction to external stimuli, and then they slowly returned to their previous mute, catatonic state. With the man this might have been expected, owing to the long duration of the malady, but with the girls, though as already mentioned, they were of greater length than any of those in the Detention Hospital, a favorable result was expected.

CASE V.—Julia K., æt. 22 years, admitted to the hospital January 25th, 1907. Diagnosis, catatonia. On examination, February 6, 1908, has mask-like expression, extremities rigid, negative, resistant, absolutely mute. Eye reflexes, including psychoreaction, hyperactive. Superficial as well as deep reflexes exalted. Hyperidrosis, cyanosis, dermatographia. Muscular mechanical irritability plus. Is seated during the daytime in a chair, motionless, with clinched hands.

Partial Lobectomy, February 20 (Dr. Follis).—On February 22, two days later, the face is not so devoid of expression, and the patient is somewhat reactive to external stimuli, though she will not speak voluntarily, but only when loudly questioned. The general condition is good, and the incision is healing nicely. T. 102° to 99°; P. 110 to 104; R. 20. She takes food readily.

Further than this the patient did not improve; the pulse decreased in frequency, though still remaining somewhat elevated. Leucocytosis in this

case was low, 6600 per cm., with erythrocytes 4,700,000. What little gain there was, was gradually lost, until at the date of writing she is now in the same state as before the partial lobectomy.³

CASE VI.—Lillian S., æt. 23, admitted to the hospital January 24, 1907. Diagnosis, catatonia. At the date of examination (February 6, 1908), there had been no change in the mental condition for many months. She sits with bowed head in her chair, motionless, with mask-like face. Both kinds of reflexes are exalted. Mechanical muscular excitability is above normal. Dermographia, profuse sweating, and cyanosis are present. The eye reflexes are too active, but the psycho-reaction could not be elicited. Is rigid and resistive.

Partial Lobectomy, February 20, 1908 (Dr. Follis).—The patient was excited and restless on coming out of the ether, but quieted down in a few hours. The temperature rose to 102°, then dropped to 99°. The pulse varied from 120 to 104. Respiration 16 to 18.

February 22.—The girl lies in bed with eyes closed, the lids occasionally twitching, but entirely mute. The face is to-day puffed and flushed. Dermographia and the other motor signs are unchanged. The patient did not improve at all afterwards. Pre-operative leucocytosis 10,200. Erythrocytes 2,716,000. Urine negative.

CASE VII.—Burton B., æt. 20 years, admitted to the hospital October 15, having been insane for a number of months. He was regarded as a bright boy at school. At the date of February 6, 1908, was catatonic, negative, with all the ordinary motor signs.

Partial Lobectomy, February 20.—After the operation he became restless, slightly more reactive to external stimuli, and for the time rigidity and negativism were absent. T. 102.4° to 104°; P. 108 to 88; R. 16 to 20.

February 2.—Reflexes, deep and superficial, unchanged; other motor symptoms unchanged. The man now speaks on urging, coherently, but is constantly muttering a string of disconnected words. The patient did not improve perceptibly during the succeeding days, and gradually lapsed into the old catatonic state.

Pre-operative leucocytosis 8600. Reds 5,504,000.

The failure of the partial lobectomy in these three cases may be attributed to one of several causes. First, the duration of the malady in all of them was longer than in any of those previously operated upon; secondly, the amount of the thyroid gland removed may not have been sufficient to induce decided changes in the

³ *April 20.*—This patient has lately shown considerable signs of improvement, and is certainly in a much better mental condition than before the operation—sufficient to allow of her being sent to her home.

metabolism, as in Case IV of this series. None of these patients has gained in weight like the others, and this should always be the rule, the increased nutrition coming, *pari passu*, with the mental improvement.

The next case was seen through the kindness of Dr. E. N. Brush, of the Sheppard and Enoch Pratt Hospital.

CASE VIII.—Luke M., æt. 25 years, a native of Marland, single, express driver by occupation, was admitted to the Sheppard-Pratt Hospital March 5, 1908.

Family History.—The father died of spinal meningitis at the age of 52 years. The mother died of organic heart disease, aged 48 years. There is no history of insanity or nervous diseases of any kind in the forebears. There was also no history of consanguinity, epilepsy, or of ancestral alcoholism.

The patient is the youngest of four children, a sister aged 30, healthy; a brother 29 years of age, married and in good health; a sister aged 26, healthy, and the patient 25 years old, who has never before been subject to mental disturbance.

Past History.—M. passed through the usual diseases of childhood. He attended the public schools from 7 to 14 years, and got along fairly well, reaching the seventh primary grade. At the age of 14 he was employed in a canning factory, where he worked for 2 years. At 17 years he was employed by Belding Bros. in their silk house. For the past 5 years he has been with the United States Express Co. in the capacity of driver, and has given perfect satisfaction, and held his position to the beginning of the present illness, which dates from the last week in October, 1907.

M. took an occasional drink, but rarely became intoxicated. Patient was of rather a jovial disposition, and attended the theaters regularly, but kept very good hours.

There is no suspicion of a luetic infection.

In the latter part of October, 1907, he suffered from a severe cold and muscular aching, probably a form of *la grippe*, which was prevalent at that time, and he remained under treatment for about three weeks. On December 14 it was noticed that he was unusually quiet, and sat for several hours in the evening without entering into the conversation. On December 16 he decided to go back to work, although he was still feeling ill. He left the house at 6.30 a. m., and did not come back until 10 o'clock the following day. When he did return, M. was unable to give an account of where he had spent the night, or to remember anything of what he had done on the previous day. To the other members of the household he appeared to be stupid, and later became mute. He also refused nourishment, so that it became necessary to feed him artificially. Since December 25 he has changed but little. After considerable stimulation he responded to questions in monosyllables, could be persuaded to eat his meals, seemed per-

fectly willing to remain in bed, and like a child required to be dressed and be attended to. If placed on a chair he remained there until someone came to change his position. He never resisted attention, nor was there any apparent muscular rigidity.

On his admission to the institution he was put to bed and given the usual routine treatment. After considerable urging he told his name and address to the examining physician, but further than this it was impossible to obtain any response.

March 7.—The patient has slept very well since his admission, without the aid of hypnotics. He will reply to questions only after some urging, and then in monosyllables. Is somewhat resistive. There are occasional outbursts of incoherent laughter. Usually he lies quietly in bed, and so far is tidy in his habits. The facial expression is blank. An examination of the cutaneous sensations showed considerable anesthesia and analgesia; even a pin-thrust through the ear meeting with no response. M. has to be urged to eat, but it is sufficient to place a fork in his hands and the food before him.

Patient is a poorly-nourished man, weighing on admission 116 lbs. (normal weight 135 to 140). The skin and mucous membranes have a good color. The palatal arch is high.

Pupils regular in outline, 2.5 mm., reacting over-promptly to light, accommodation, consensual, and McCarthy reaction.

Lungs negative. Heart sounds somewhat accentuated, both at apex and base. Pulse 80 to the minute. There is a light degree of peripheral arteriosclerosis.

Abdomen negative.

Thyroid gland somewhat enlarged, especially the left lobe. No other glandular enlargements.

Genitalia negative; cremasteric reflex present.

The superficial and deep reflexes are everywhere very active. Muscular mechanical excitability above normal. Dermographia slight but persistent. Slight hyperidrosis of the hands.

March 20.—There has been no change in the patient since the last note was made.

April 20.—M. has continued in the same inert, mute condition as during the past month. On considerable urging to answer, he will reply in monosyllables. He also goes through the prescribed gymnastic exercises, but displays no interest in them. He smiles a great deal without apparent cause, and frequently gives vent to loud laughter. He never asks for anything, and is apparently contented with his surroundings. If left alone he will remain in bed or will sit wherever placed for hours. He will not eat except after urging. Occasionally he is uncleanly in his habits.

April 25.—After a close examination into the man's physical state a partial thyroidectomy was decided upon.

Blood Examination.—Red cells 6,500,000. Leucocytes 5000. Differential count: Neutrophiles 67.4 per cent. Small monos. 23.00 per cent. Large

monos. 8.00 per cent. Eosinophiles 2.40 per cent. Basophiles 0.40 per cent. Hemaglobin 92 per cent.

Previous to the determination upon an operation, the patient had been treated with 16 gr. of thyroid extract, daily, for several weeks. On its administration there was a rise of the bodily temperature of several degrees, also an increase of the pulse rate, both of which fell after the first week. Mentally, during this period, there was little change in the man's condition; perhaps a little more dullness.

April 30.—Partial thyroidectomy about 5 p. m. (Dr. Follis), about four-fifths of the left lobe of the thyroid gland being removed, the parathyroids and blood vessels being carefully spared. Macroscopically the excised portion of the gland seemed firmer than natural, especially in two places, where it gave the finger the feel of a firm nodule the size of a bean. On section of these firmer places nothing could be delimited from the surrounding portions of the gland, though there was seemingly a lessened amount of colloid material in these places.

May 1.—After recovering from the anesthetic, M. was sleepless and restless. Later was given a quarter grain morphia, after which he slept until morning. When visited by the house physician at 10 o'clock a. m. he talked rationally and rather freely, and said that his "mind felt clear."

Patient's memory this morning is good. He gives dates correctly up to about Christmas, and explained his mutism by saying that he felt dull and indifferent, also that at times he tried to speak, but could not. Patient is quite cheerful, makes joking remarks, and seems to be appreciative of his entire illness, as well as of his present condition. No definite delusions or hallucinations can now be determined.

Interrogative.—Q. How long did you work for the Adams Express Co? A. United States. Q. How long at the United States Co.? A. Five years. Q. Were you in the store? A. Wagon. Q. Always on the wagon? Shakes head. Q. How are you feeling? A. A little sore. Q. Can you talk better than before the operation? A. Yes sir.

May 3.—Blood count: Leucocytosis 10,400. Neutrophiles 73 per cent. Small monos. 17 per cent. Large monos. 8.5 per cent. Eosinophiles 1.2 per cent. Basophiles 0.3 per cent.

May 4.—The stitches were removed from the wound to-day. Mentally the patient is not so active as the morning following the operation. He answers the majority of the questions fairly well, however, and promptly. He is also appreciative of what is going on around him, and shows some interest in the other patients, about whom he makes jocular and pointed remarks.

Later in the day M. related a number of incidents in his past life. He spoke of having a peculiar sensation when in his stupid condition, also that he thought he was in foreign countries, mentioning Africa; that there were savages around him, and that in some way he was controlled by these savages. He then returned to the peculiar sensation referred to above, which was as if he were "pushed up and up" until he was on the top of a

high tower, then he would suddenly fall "down, down," after which he would be fighting for his life until finally he was "broke up" and went off into "nothing." Patient slept badly last night and was disturbed by noises.

May 5.—M. is mute this morning, but after urging, responded in monosyllables. In the afternoon he spoke freely to the house physician, and showed but slight mental retardation. Leucocytosis 9700. Neutrophiles 71.8 per cent. Small monos. 14 per cent. Large monos. 11 per cent. Eosinophiles 2.0 per cent. Basophiles 0.2 per cent.

May 9.—The wound is entirely healed. Mentally the patient shows increased retardation over that of four or five days ago, but there is considerable variability during the day, as he sometimes responds much more promptly than at others.

May 12.—To-day the patient is talking much more freely. He now takes the initiative, and shows a marked interest in his case, as well as very good insight into his mental condition.

Interrogative.—Q. When were you operated on? A. Friday. Q. How many days is it now since the operation? A. Twelve. Q. What is to-day? A. Tuesday (correct). Q. You are feeling a lot better, are you not? A. I can't kick. Q. Do you not remember what has happened to you in the past three or four months? A. No! like when I was taken sick I had a bad fever and laid on the bed, and that was the last I remember until I came to again. Q. When did you come to? A. They say it was a couple of weeks; don't know whether they operated on me or not. I know at one time I was seeing everything from a lamp post to a freight car. Q. Do you know that you were away from home for a night and a day when you were first taken sick—do you remember anything about it. A. I remember that I walked and walked for a while, and then I came back and went into the house, and I heard somebody say, "who is it?" I must have looked so dog-gone bad they didn't know me. I took some coffee before I went to bed, and that is the last thing I remember. I had periods when I went off. Q. How long were the periods when you felt all right? A. Like to-day I would feel all right, and to-morrow I would feel half dumb—not exactly a lunatic—just felt like you didn't care what happened. Q. Had you been drinking then? No sir, not a drop. I admit I have drank, and have been intoxicated more than once. I had fever—just like my head was going round—just like I was intoxicated—like my brain was on fire. Q. Did it come on suddenly while you were at work? No. During the night I was taken that way, and when I started to work I was just about half crazy, and I just wandered about, and they said I didn't come home until the following day. Q. You had some ideas of suicide, didn't you? A. I tried to. I felt distressed. Q. Over your condition, because your mind was confused? A. Yes, that was it, and I knew that I would never be the same man again after what I had gone through. I know that I am not the man now I was—before I was taken sick.

May 19.—Leucocytosis 8200. Differential count: Neutrophiles 62 per cent. Small monos. 31 per cent. Large monos. 4.1 per cent. Eosinophiles 2.2 per cent. Basophiles 0.2 per cent.

May 20.—Since the last note taken, M. has gradually gone backward and is now in about the same mental condition as before the operation. He is mute, does nothing whatever to occupy himself, has to be urged to eat, and at times it is necessary to feed him, and remains in one position for hours at a time.

May 26.—During the past week the patient has gained four and a half pounds, also, now, after considerable urging, he will respond to questions, and is gradually becoming a little brighter.

May 28.—Interrogative: Q. M. what are you reading? A. With Lee in Virginia. Q. Is it interesting? A. Just started it. Q. How much have you read? A. Where the negro, he gets on the boat and starts away to England. Q. Is that all? A. He was a run-away slave. Q. What trouble did he have? A. It was just about why the Civil War broke out—he was beaten by an overseer of the place, was helped away, and escaped by (the aid of) the son of the man that owned the place. Q. How do you feel? (pause). Q. Does your head ache? A. I feel pretty good. Q. Appetite good? A. Yes sir.

May 30.—M. was again reading a book his sister brought him, and was able to remember the run of the story so far as he had read, and after considerable urging would answer questions about himself.

June 26.—M. is progressing slowly, is gaining weight and is slightly more active mentally. A few days ago he was placed on lecithin and milk.

Interrogative.—Q. You are feeling better, are you not? A. Yes sir, I feel pretty good. Q. Gained in weight? A. Yes sir. Q. How many pounds in the last two weeks? A. About ten.

M. is gradually gaining in weight. He responds to questions readily, and for the past week has shown marked improvement in his mental condition. He takes an interest in games, reads the papers and magazines, and puts new life into his gymnastic exercises. Patient plays an exceptionally good game of checkers, and seems to enjoy it. The deep reflexes are nearly normal, the superficial ones are still exaggerated. Mechanical muscular excitability is still plus. Dermographia has vanished.

July 6.—Leucocytes 5500. Neutrophiles 54.5 per cent. Small monos. 41.4 per cent. Large monos. 1.5 per cent. Eosinophiles 1.6 per cent. Basophiles 1.0 per cent. Blood pressure 120 mm.

July 14.—The patient is steadily gaining in weight, and has attained 130 lbs., nearly the normal. There is great mental improvement, though some thought retardation remains; besides the facial expression is not natural. The eye and superficial reflexes are still too active. The lecithin and milk are being continued.

August 30.—M. has gradually improved since the last note, and has continued to gain in weight, though more slowly. He responds to questions promptly, and gives a fairly accurate account of his illness since his arrival at the hospital, but has complete amnesia for a number of weeks previous to his admission. He remembers leaving home, a few weeks before Christmas, with the intention of going to work, but is unable to

give any account of himself for the next two days, and now does not recall going home.

The memory for remote events is good. M. now reads the papers, plays checkers and baseball, and shows a fairly good grasp on current events, also remembers accurately what he reads.

When asked for his reason for not replying to questions during his illness he states that he was unable to think quickly, also that he believed that there was a war going on between the Protestants and Catholics, and that in consequence he was despondent and contemplated suicide. At the same time he realized that his mind was affected, also that he felt that he would not recover.

He now thinks that he is perfectly well, and daily growing stronger, also that he will soon be able to take up his work. The judgment seems good.

Interrogative.—Q. Do you think you are as well now as before your illness? A. Yes sir, I feel perfectly well. Q. Do you think as quickly as you did before your illness? A. Yes sir. Q. And as clearly? A. Yes sir. Q. Interested in everything? A. Yes sir, I am—you mean take notice of things? Q. Interested in things in general as previously? A. Yes sir. Q. What do you intend doing when you go home? A. Knock around for a couple of weeks, and get used to walking over those cobble-stones (smiling), and then go to work. Q. Is your position still open? A. The boss came up to the house a couple of times, and said any time I came back it was open to me. The fellow that has my place falls back into his own when I go back. I don't like to knock him out, but number one comes first. He goes back on single wagon when I go back, at least that's what the boss told me. Q. You think that you are perfectly well do you? A. Yes sir, I feel all right. Q. Do you realize that you have been pretty sick? A. Yes sir, I felt that I would never eat another Christmas dinner. I feel all right now, feel that I could do a little work, in fact I think when I get back to work I will feel better—get my mind down to working. Q. Do you remember being tube fed at home? A. No sir, I don't remember that, that's when I seen stars I guess. I remember I felt at one time like someone was banging me around from post to post. I'll try and forget all that part of it when I get back (smiling), (pause), you certainly did fix me up, and I appreciate it—you could not have done any more (somewhat embarrassed).

Discharged, September 17, 1908.

December 3.—M. reported to-day. He has been working steadily from 6 o'clock a. m. until 8 p. m. since October 1 for the express company. He is mentally normal, the memory excellent, and reaction time good. He also has plenty of energy.

The man weighs 133½ lbs. (height 5 ft. 7½ in.). The neck over the thyroid gland is 32½ cm. There is no area of thymus dullness, nor evidence of persistent hypertrophy of the remaining half of the thyroid gland.

The reflexes and mechanical muscular excitability are rather above the

normal. Dermographia and hyperidrosis have entirely disappeared. The circulation is good. P. 74.

The man was warned against over-exertion, and instructed to take a larger allowance of milk than he had been doing, also to eat more regularly.

HISTOLOGICAL EXAMINATION OF THE THYROID TISSUE (DR. CLARENCE B. FARRAR).

The only divergence from the normal was the distention of practically all the follicles with colloid material. The lining epithelial cells are obviously much flattened, there being nowhere any cylindrical cells. Many follicles were of considerable size, and obviously represented confluences of several follicles. In many instances the distended follicles occupied the microscopic field, the inter-follicular connective tissue fibers being reduced to a minimum. In themselves, the connective tissue and blood vessels showed no pathological changes, also, there was no evidence of any inflammatory process.*

LECITHIN IN CATATONIA.

The very excellent results that have followed the administration of the alcoholic solution of lecithin in many cases of nervous asthenia (not cerebraesthesia), as well as in a few cases of exophthalmic goiter, for of the latter malady I do not see any considerable number of examples during the course of a year, has led me to try the same remedy in a few cases of early catatonia.

Curiously, the neurasthenics and goiter cases, despite the nauseous and disagreeable smell of the alcoholic solution of lecithin, cling to the remedy as an opium habitue does to the latter drug, and never seem to tire of it until the nervous symptoms are allayed, and the gain in weight approaches the normal. Again, all the goiter and asthenics patients, who are on lecithin, state that an hour after the medicine is taken "their nerves" are quiet, and for a time there is cessation of the active symptoms, such as the tremor, and a slow return after some hours. Some of the cases compare its tranquilizing power to that of the bromides, but state that it is much greater. I have had a number of cases of asthenia

* A ninth case, a young woman of 24 years, was operated on December 10, 1908. A month afterwards there was a return to the normal of all the corporeal signs, while the psychical symptoms were progressively diminishing, the only thing remaining being a hardly perceptible mental retardation. This case is still under observation.

placed for alternate weeks on lecithin, and a compound preparation of the glycerophosphates of sodium, calcium, iron, manganese, with or without the glycerophosphate of quinine and extract of gentian, only to find them lose weight, with increase of the nervous phenomena on the glycerophosphates, and a gain in weight with abatement of the nervous symptoms while on the lecithin. In both weeks the hyperalimentation remained the same, so that nothing could be attributed to differences in diet.

It is naturally not to be expected that either asthenic nerves or the Graves's malady is to be cured within a week or a month by these remedies, and, again, it is often not possible to place the patients on the lecithin when they first come for treatment, for the disordered digestion, or other accompanying ailment must first be treated before the lecithin can be administered. As a rule, it acts far better when the hemaglobin is below 70 per cent, Gowers, and the coagulation of the blood is slow. Again careful attention to the diet should never be forgotten, remembering that every individual has idiosyncrasies toward certain food products that must be respected, also that patience and the careful notice of trivial symptoms, as well as the judicious treatment of these, will repay in increased comfort for the patient.

None of the patients with asthenia or Graves's who were placed on lecithin were subjected to the full rest treatment; at first, they are compelled to stay in bed until nine or ten o'clock in the morning, and the remainder of the day is spent out of doors, practically idling. After the gain in weight becomes pronounced, and the nervous phenomena show signs of abatement, they are encouraged to again take up the lighter portions of their duties, and if they still gain, more and more of the ordinary occupations of life are gradually added, though for a time active exercise is always restricted.

A few words on the action of lecithin in exophthalmic goiter. I only cite from a few examples. A patient with the typical symptoms of the malady, who had been through the hands of a number of reputable physicians without benefit, was discharged at the end of three months with entire abatement of the symptoms and large gain in flesh. Another who had lost 69 pounds before she was referred to me, gained 27 pounds in the course of five months

with entire loss of the nervous phenomena. At the end of this time she was subjected to severe mental strain, lost three pounds under it, and showed a slight return of the heightened reflexes and hyperidrosis, but on being again placed on the lecithin these phenomena subsided. Another case of unusual severity is entirely well after a year's treatment, though she still has to avoid over-fatigue to the date this is written.

Though lecithin is a constituent of every cell of the body its action as a medicine is, as yet, not fully understood. As an erythrocyte producer, with *pari passu* increase of the leucocytes, as we have already seen in the earlier portion of this article, it has no equal, iron, manganese, as well as other ordinary tonics falling far behind it. It is evident, however, that it has other and more essential properties than a blood inducer.

We have shown in quite a variety of maladies that afflict the human being, in which there is reason to suspect the presence of a derangement of the functions of one of the internal secretory glands, that lecithin acted as an antihormone to this glandular secretion. This is rather singular, when it is remembered that the active chemical constituent of the product is phosphorus, which, along with iodine, is usually regarded as a stimulant to the secretions, especially of the glands in question.

Now we find the reverse action, the phosphorus nullifying the activity of the thyroid hypersecretion, or better, and to put it differently, we find the phosphorus compound stopping the active nervous symptoms in two maladies, Graves's and catatonia, that we have some reason to believe, is due to a perversion of the internal secretion of the thyroid gland. The most plausible explanation of its action is that it stimulates to greater activity the resistive powers of the tissues themselves, aids in inducing a regenerated blood formation, and increases the phosphorus content of the white corpuscles of the blood.

When the symptoms of nervous derangement is asthenia or Graves's malady have abated, we have found arsenic the best agent to keep up the action of the lecithin, yet the two chemicals are apparently antagonistic in their action. Evidently we have not yet arrived at an unequivocal knowledge of these several agents, and a more widely extended investigation should be made, includ-

ing that of the chemical laboratory, indeed the purport of this article is entirely suggestive, and not intended to be assumed as positive.

THE THYRO-LECITHIN TREATMENT OF CATATONIA.

Even more than thyroidectomy in catatonia this form of treatment is as yet in its early infancy, but the fact that three cases at least have gotten well under it, leads me to believe that there is some future for its more extended use. If it can do no good, it can at least work no harm.

I cite but four cases of the malady that have been subjected to the lecithin treatment combined with the thyroid extract in two grain doses given in alternate weeks. The thyroid extract in small doses apparently acts as an excitant to the bodily metabolism, and its service otherwise can be disregarded.

CASE I.—The first in which it was tried was Miss G. M., æt. 20 years, a well-educated young woman, one of more than the average intellectual ability. She had not passed beyond the first stage of the malady when the treatment was begun. She showed the characteristic motor signs, and from having previously been active and intelligent had grown indolent, anergic, difficult to arouse in the morning, with marked lesion of attention. The thyroid was soft, though about the usual size. P. 92, lacking in tone. There was also slight accentuation of the second aortic and second pulmonary sounds, but no arterio-sclerosis.

The blood examinations were different from any case we have yet had examined, and resembled more closely the hebephrenic than catatonic blood.

February 10, 1907.—Hemaglobin 89 per cent. Leucocytes 11,000. Large monos. 43 per cent. Small monos. 8 per cent. Neutrophiles 46 per cent. Eosinophiles 1 per cent.

February 17.—Lecithin one week. Hemaglobin 90 per cent. Leucocytes 11,200. Large monos. 22 per cent. Small monos. 32 per cent. Neutrophiles 42 per cent. Eosinophiles 3.2 per cent.

February 27.—Thyroid extract. Hemaglobin 90 per cent. Leucocytes 14,500. Small monos. 36 per cent. Large monos. 8.5 per cent. Neutrophiles 54 per cent. Eosinophiles 1 per cent.

May 20.—Small monos. 45.5 per cent. Large monos. 8.1 per cent. Neutrophiles 42 per cent. Eosinophiles 3.5 per cent. Mastzellen 9 per cent.

September 21.—Large monos. 4.8 per cent. Small monos. 19.2 per cent. Neutrophiles 72 per cent. Eosinophiles 3.6 per cent. Mastzellen .4 per cent.

March 20, 1908.—Red cells 4,278,000. White cells 8260. Small lymphocytes 22.6 per cent. Large lymphocytes 1.0 per cent. Transitionals 5.3 per cent. Neutrophils 65.3 per cent. Eosinophiles 4.1 per cent. Mastzellen 0.5 per cent.

The variations in the differential count is most remarkable, yet some allowance must be made for the several methods of the various men who have made the examinations.

This case has undergone a great variety of alterations. During February, March, and April she was lethargic and catatonic; in May and June excited and erotic. In July and the subsequent months to November, she appeared to be normal; in November there was some slight return of the catatonic symptoms (she had not been given lecithin for several weeks). From November to the present date she has been normal, so far as can be told from her conduct and letters. I cannot positively state that the case is cured, only the characteristic symptoms have entirely abated, and letters show that there is no lowering of the mental acuity, whereas in the ordinary course of events there should be beginning dementia.

CASE II.—G. M. R., a boy of 19 years, was first seen on May 9, 1907. For the previous two months he had been showing alterations of disposition, difficulty in facility of thought, a complete change from his usual active habits to indolence and apathy. There was also great difficulty in getting him out of bed in the morning, and if left alone he would lie there indefinitely. Definite delusions or hallucinations could not be determined, and the boy would reply to questions only in monosyllables, and then after repeated urging. Previous to the beginning of the attack he had stood well at school. The physical examination showed the usual motor signs of catatonia, including emaciation, hyperidrosis, and exalted reflexes. The thyroid gland was about the normal size, but soft, and there was no area of thymic dullness. This boy was treated for six months by hyperalimentation, and alternating weekly thyroid extract with lecithin, and at the end of that period was entirely well, and has continued to remain so.

An examination at the beginning of the treatment showed: Red cells 4,200,000. Leucocytes 11,000. Small lymphocytes 26 per cent. Large lymphocytes 6 per cent. Neutrophils 68 per cent. Eosinophiles 2 per cent. Mastzellen 0 per cent.

CASE III.—Was a female in the Detention Hospital, with clearly-defined, but well-advanced catatonia, and beginning to dement. Her age was 23 years. The lecithin treatment had absolutely no effect on the progress of the malady.

CASE IV is given in more detail than the others, as the patient was in full control in the hospital, and daily notes and examinations could be made.

CASE IV.—Emma L., single, æt. 20 years, was admitted to the Detention Hospital, June 1, 1907. Diagnosis, catatonia.

Family History.—The parents are of German extraction. The father is living at the age of 63 years, and is in good health. The mother died at the age of 57, of unknown causes. The only known nervous malady in the family was that the grandfather died after a paralytic stroke. L.'s father is a moderate drinker, mainly of beer. Patient has three brothers, and two sisters, all in good health, except that one of the brothers is a heavy drinker. Two of the children are younger than the patient.

Past History.—The birth was normal. The only malady of childhood was measles. L. attended the public schools for five years, and was looked upon as an industrious and intelligent girl. Menstruation began at the age of thirteen, was regular, and not attended by disturbances of the nervous system. The girl has never been addicted to alcohol or other drugs. She has always led a quiet life, keeping house for her father.

Present History.—The first indication of a variation from normal mentality was about four weeks ago. She then began to grow listless and dull. In the morning it was difficult to arouse her, and at a later stage she refused to get out of bed at all, and remained there the entire day, requiring to be fed and neglecting the bowels and bladder. Within a few days she became markedly negative, resisting all attention, and if placed on a chair would remain there the livelong day motionless. On the day preceding her admission to the hospital she became very restless and difficult to control.

On admission, June 1, she was excited, incoherent, loquacious, but the idea-flow was impoverished. Speech was rather slow. Delusions were vague, and hallucinations were not determined.

Examination.—Skull conformation regular, 53 cm. in circumference. Index 79.4. The general condition is good, and the muscles are not flabby. The skin is sallow, but there is no bronzing or eruptions. The eyes are not prominent; the iris is hyper-reactive to light, sympathetic, consensual, and psycho-reactions. Pupils 2 mm. The palate is high-arched.

Pain and tactile sensations are apparently normal. The deep and superficial reflexes are markedly exaggerated. Mechanical muscular excitability is equally exaggerated. Dermographia is well defined. Tremor is present about the small muscles of the face and tongue, but is not marked.

The extremities are cold, clammy, and bluish. There is slight accentuation of the second aortic sound, but otherwise no abnormality in the heart's tones. P. 88; T. 99°. Physical examination of the viscera showed nothing abnormal. The thyroid gland is of normal size, soft in consistency. There is no area of thymic dullness.

No hallucinations could be noticed during the examination, and the delusions are vague and unsystematized. Muscular rigidity is present, though not particularly well-marked. Negativism is present. The urine was negative, except for traces of indican.

The girl was kept under observation for a period of two weeks before

any treatment, other than hyperalimentation and an occasional purge was given. For a week after admission she remained excited, with a good deal of motor restlessness, and occasionally an impulsive outbreak, but for the greater part of the time she was anergic, stuporous, though the depth of this was never so great but that she would respond to simple questions in monosyllables if shaken and the questions repeated over and over again. In no way did the symptoms vary from those of an ordinary mild case of catatonia.

On June 26 the patient was sent to the hospital ward and placed upon alcoholic solution of lecithin, one fluid drachm, t. i. d., alternated with thyroid extract in 2-gr. doses, with increased alimentation.

July 2.—A re-examination to-day showed that the motor symptoms to be about the same as when the girl was admitted to the institution. The deep and superficial reflexes are much exaggerated, and mechanical muscular irritability is equally so. Dermographia is well-marked, is readily elicited, and remains for a number of minutes. There is no cutis anserina. There is little cyanosis about the hands and feet, but excessive perspiration is noticeable.

Some of the members of her family visited her to-day, and after their visit she became much excited, weeping and crying to go home. Later, she talked incoherently to herself. L. takes food well, and sleeps profoundly. Is apparently pleased when the nurse takes her for a walk on the grounds, and takes some interest in watching the other patients and in the music. T. normal to slightly subnormal. P. 96 to 110.

July 9.—Thyroid extract was begun in 2-gr. doses daily, this morning. The girl has been very nervous, as well as excitable, for the past two days, and has had hallucinations of sight. The pulse has also been high, mounting to 128 beats. T. 98.6° to 98.8°. Is inclined to be constipated and the appetite is not so good.

July 12.—Hallucinations are occasionally noted. T. 99°; P. 115; B. P. 130 R. R.

July 14.—The troublesome hallucinations have not been present to-day, and the excitement has abated, but in place she has become quiet, taciturn, and is beginning to neglect the small amount of work that has been given her to do about the ward. She has also begun muttering constantly to herself. Leucocytosis 12,000. Red cells 4,000,000. B. P. 140; P. 100 to 110; T. 99°.

July 14.—Patient was returned to the lecithin solution, given as before. To-day, L. is again restless, easily startled, and when frightened screams loudly and beats her head with the hands. Appetite very poor. T. 99°; P. 112.

July 16.—The girl is to-day talking in a loud voice, screaming, gesticulating, and gritting her teeth together. The motor symptoms are unchanged. Appetite improving and vegetative functions normal. T. 99°; P. 112.

July 20.—L. is to-day much more quiet, and is talking slowly and co-

herently. She told the nurse that she was ashamed of herself for acting so badly during the past few days, and recognizes that her mental condition is not a normal one.

July 21.—To-day the girl is excited, talks incoherently to herself, and constantly picks at the skin of her hands. Thyroid extract, 2 gr. per diem.

July 23.—The general symptoms are unchanged, except that attempts at masturbation are made from time to time.

July 28.—L. has been brighter, is coherent at times, and has resumed her duties about the ward. T. normal; P. 95; B. P. 130; leucocytosis 12,300.

July 29.—Was returned to the lecithin to-day. Is working a little, but without much energy.

August 4.—Continues to be somewhat brighter. Motor symptoms unchanged. There are occasional attempts at masturbation.

August 6.—Thyroid extract, 2 gr. per diem.

August 10.—The girl is now doing much better than at any time since admission. She is brighter, more intelligent, has shown no delusions or hallucinations, and takes considerable interest in her work, as well as in the other patients. The motor symptoms are little changed; perhaps the reflexes are not quite so exalted. The leucocytosis is rising, and varies from 13,000 to 17,000.

August 12.—Lecithin as before. L. speaks sensibly, coherently, and collectively. Appetite ravenous and vegetative functions normal. The extremities are not perspiring so freely. T. 98.8°; P. 80 to 96; B. P. 140; leucocytosis 12,000. An examination of the motor functions showed dermatographia to be marked, reflexes and mechanical muscular excitability considerably above normal. Pupils 2½ mm. Hyper-reactive to light, sympathetic, and psycho-reactions. The second aortic sound is accentuated. There is slight arterio-sclerosis. Muscular rigidity is present at times. There is no negativism.

August 18.—L. has shown considerable mental confusion during the past three days, and is again inclined to sit still and weep, though she now tries to conceal her emotional state from her fellow patients. She is again inapt and indolent, and talks to herself a good deal. P. 90 to 95; T. normal; leucocytosis 12,000.

August 20.—Thyroid extract, 2 gr. per diem. L. has been better to-day, is well-conducted, sensible in her conversation, and is working about the ward assisting her nurse. Is also sewing at some embroidery. Is cheerful, and looks forward to a return to her own home. She maintains a conversation quite well, and the orientation is good, which has not always been the case. Memory for past events fair. Pupils 2½ mm., slightly hyper-reactive. The hands and feet are warm, not perspiring much, and are not cyanotic. Reflexes and muscular excitability abnormally active. No tremor of lips and fingers. No negativism or muscular rigidity. Sleep and appetite normal.

August 26.—There has been no especial change with the patient since

the last note was made. The facial expression is more natural. There has been considerable gain in weight since admission, and especially in the past month.

August 29.—Lecithin as before. L. is bright and lively; now reads a good deal, and takes pride in having her dresses clean and orderly. B. P. 130; leucocytes 10,200; P. 91; T. 98° to 98.6°.

September 2.—L. continues to be cheerful, intelligent, entirely oriented, and the memory for past and present events is excellent. Thyroid extract, 2 gr. per diem.

September 6.—Patient is menstruating for the first time since her admission. The sensorium is clear, the woman is cheerful, neat, and working well, and is acting as assistant to the ward nurse. Appetite, digestion, and sleep are natural. T. 98.6° to 98.8°; P. 90; leucocytosis 9000 to 12,000.

A physical examination showed: Pupils $2\frac{1}{2}$ mm., normally reactive. Reflexes deep and superficial, normal. Extremities warm and dry. Tremor of the tongue and fingers is hardly noticeable. Dermographia present, though not vivid. No mannerisms, no stereotypy, no muscular hyper-tension. Muscular mechanical excitability somewhat above normal.

September 9.—Lecithin t. i. d. The even return to mental health continues. Patient is willing, cheerful, industrious, and is showing herself more and more capable. When not at work she spends most of her time out of doors reading. There is now a steady gain in weight.

September 17.—Thyroid extract, 2 gr. per diem. There is uninterrupted improvement.

September 24.—Lecithin. There has been no return of mental symptoms. Patient continues to be cheerful and industrious, working steadily from 6 a. m. to 4 p. m. The leucocytosis is now diminishing, varying between 7000 and 9000 per cm. Deep and superficial reflexes are not so exalted. There is no tremor. Mechanical muscular excitability is diminishing. Dermographia is less marked, and perspiration has ceased entirely. Neck 33 cm. Thyroid palpable; no noticeable change in its size, but it seems a little firmer. L. now weighs 125 lbs. T. normal; B. P. 125. Is looking rosy and well-nourished. Her general conduct is all that could be desired.

September 24.—Thyroid extract discontinued; is now on lecithin alone. There has been no change in the mental disposition since the last note. Memory is excellent, and she is most industrious. On September 30 was sent home, with orders to report to the hospital at the end of the week.

October 8.—L. reported this afternoon for examination. The members of her family say that the girl has been quite herself, and has shown no sign of disturbed mentality. The patient herself converses intelligently, and sustains a conversation without apparent effort. Weight 130 lbs. Color good. Neck 33 cm. Thyroid palpable, possibly a little firmer to the finger than when she was admitted in June. There is no area of dullness over the site of the thymus gland. Dermographia markedly diminished. The reflexes and muscular mechanical excitability are close to the natural. No hyperidrosis, no muscular tremor.

November 20.—L. has shown no signs of relapsing.

December 27.—L. is still normal, though at home she has had to contend with the brutalities of an intemperate brother.

January 20.—The girl has continued in her normal state, working hard, and attending generally to the duties of a housekeeper.

April 5.—There has been no relapse.

July 20, 1908.—There is no alteration of the mentality.

September 20, 1908.—Patient remains in excellent health.

BLOOD EXAMINATIONS.—EMMA L.

Date.	Red cells.	White cells.	Hema-globin.	Polyns.	Small monos.	Large monos.	Eosln.	Trans.	Mastz.	Blood press. (R. R.)
July 30, 1907.....	3,228,000	12,200	65%	68.0%	26.0%	3.0%	2.0%	.5%	.0%	130
Aug. 1.....	3,696,000	11,200	65	67.5	26.0	2.0	2.5	1.5	.5	135
" 5.....	3,720,000	9,000	70	64.5	27.5	4.0	2.0	2.0	.0	130
" 10.....	4,750,000	8,660	75	70.0	23.5	3.0	3.5	.0	.0	130
" 20.....	5,100,000	9,700	75	72.0	23.0	2.5	2.0	.5	.0	140
" 24.....	5,800,000	9,700	75	70.5	24.0	3.5	1.0	1.0	.0	130
Sept. 3.....	5,700,000	9,000	75	74.0	22.0	2.0	1.0	1.0	.0	130
" 12.....	5,750,000	9,100	80	67.0	28.0	2.0	1.0	2.0	.0	125
" 21.....	5,700,000	7,000	75	64.0	30.0	3.0	2.0	1.0	.0	125
" 30.....	5,700,000	9,000	75	70.0	24.0	3.0	2.0	1.0	.0	125

CONCLUSIONS.

I. That the number of cases thyroidectomized are, to date, insufficient upon which to base conclusions of a definite character.

II. That the results of the histological and chemical examinations have been inconclusive, as to whether or not we have to deal with a perversion of the secretion of the thyroid gland in catatonia.

III. Nevertheless, it is possible, from the symptoms, that in catatonia we have a perversion of the secretion of that organ, and that partial thyroidectomy induces a return to the normal in the secretion of the remaining portion of the gland. The return to the natural state of the reflexes, the decrease of the mechanical muscular irritability, as well as of the dermatographia, the loss of pigmentation, also of the doughy, pasty character of the skin (most noticeable in the prodromal and stage of mutism), and the later return to the normal both of the mental as well as physical state, are at least suggestive that partial ablation of the gland is a factor, and has something to do with the rapid recovery.

IV. It is possible that the secretion of the parathyroid glandules nullifies, in a way unknown at the present time, the activity of the

thyroid hormone, and that the ablation, in part, of the thyroid gland, helps in promoting the function of these minute bodies. After the operation, all the blood supply that formerly went to the entire half of the thyroid body is now diverted to but a small remainder and the supply to the parathyroid glandules must be enormously increased.

V. It would be exceedingly difficult to find eight successive cases of catatonia, that recovered their mental integrity under any previously known treatment, as these eight cases have done. In Case I, the rise and fall of the mental and motor symptoms, as the remaining half of the thyroid hypertrophied and then decreased in volume, is, to say the least, very suggestive that an alteration of the secretion of the thyroid gland is a very material factor in the causation of the symptoms. This clouding of the mental faculties, when the remaining portions of the gland began to hypertrophy, has been noted in several of the other cases.

VI. The partial ablation of the thyroid gland may produce unknown changes in the general metabolism of the entire body, induced, first, by a relatively high leucocytosis following the operation, equally with a withdrawal from the general circulation of a portion of the thyroid hormone that is known to induce destructive metabolism. In all the patients that have had a sufficient time to fully recover, a marked change in the nutrition has supervened (both after the thyroidectomy as well as after the thyro-lecithin treatment), so that within four or five months after the ablation, or the completion of the thyro-lecithin treatment, there has been the enormous gain of from 30 to 50 pounds added to the weight, and this not confined to the adipose tissues but equally noticeable in the muscular system.

VII. It is hardly possible that chance could have favored us in the selection, at random, of eight successive cases of catatonia, for such favorable results.

VIII. The thyro-lecithin treatment is productive of constant results only in the prodromal state. It acts probably by increasing constructive metabolism, but may also act by nullifying the thyroid hormone, just as iodine increases its activity.

IX. Partial thyroidectomy may be of avail in cases of catatonia only before organic changes, such as have been described by

Alzheimer, and more recently by Zalplachta, have begun in the brain tissues.

X. The operation is not free from danger to the life of the patient, unless the utmost care is taken to insure unusually free drainage; also the chances of an infection, or of a broncho-pneumonia, or bronchitis, are always considerable, the low vitality of the patients having to be taken into account. Though the gland in these cases is of approximately normal size, it takes a surgeon of previous experience in the school of exophthalmic goitre to properly perform the operation, and to judge, from the size of the gland, just how much of the organ should be removed to insure effective results.



THE KNEE-JERK IN PARESIS.

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The diagnostic import of changes in the character of the knee-jerk in paresis, especially the absence of the reflex, was recognized soon after the description of the reflex by Erb and by Westphal. The conditions of exaggeration, and, much more, of diminution or absence have been taken to indicate the existence and the amount of the pathological changes that occur in this disease, but exact correlation of the character of the reflexes with other symptoms and with the general state of the nervous system have not been made. In a way it is surprising that in this disease, which is known to be a degeneration of the nerve elements, patients are still classified according to the mental picture—exalted or grandiose, depressed and demented—and that so little has been accomplished towards establishing neurological types. It is not unreasonable to suppose that a careful working over of paresis in its physiological aspects may give us types clearer and perhaps more valuable from the neurological view-point, than can long study and correlation of the mental phenomena. It is conceivable and probable that a study of the functional differences will lead to a better appreciation of the nervous changes, and at the same time will serve to produce a better understanding of the course of the disease. It is also likely that the correlations of the various structural and functional changes will assist to make diagnoses more accurate, especially in the earlier stages of the disease, and that the correlation of the findings will show us views of conditions or of combinations of symptoms that will aid in more accurate prognoses. In such a work the reflexes which give so much information regarding the state of the nervous system need most careful investigation, and all the symptoms that can be observed should be correlated with these phenomena.

I. CHARACTER OF THE KNEE-JERK IN PARESIS.

The knee-jerk in paresis may remain normal, or may differ from the normal in any one of three ways—it may be exaggerated, it may be diminished, or it may be impossible to elicit it.

In speaking of the reflex, the term exaggeration is used in a very loose manner. There are a number of ways in which the term may be and is employed, but perhaps for many years the different meanings will be used indiscriminately. Sternberg has described the following different meanings of the term:

1. The reflex threshold may be slightly below the normal; in other words, the threshold of blow necessary to produce the reflex is decreased. This meaning of the term has not been well investigated and there is some doubt that the intensity of the blow, within wide limits, has an influence on the reflex.

2. The latent period of the muscular contraction of the quadriceps muscle or the latent period of the foot movement following the stimulation of the patellar tendon may be decreased. The differences in the rapidity of the reflex are not so well marked as to make it possible for the unaided eye to discover the true differences, and the term "exaggeration" is doubtless seldom used correctly to indicate a real quickening of time.

3. The term is more often used to indicate that the time of the tonic contraction of the muscle is increased or lengthened, for this time varies considerably. Remarks on this time will be made more particularly in the second section of this article.

4. The reflex reaches its maximum in less than, say, in one to two-tenths of a second. If this maximum is reached in less than a normal amount of time, that is, if the steepness of the curve be increased, the reflex may be described as exaggerated, but in clinical work it would be impossible to determine this time accurately.

5. The spreading of the reflex, the movement of many muscles in addition to the quadriceps, is often spoken of as an exaggeration. This use of the term is partly justified, in that the spreading is undoubtedly due to exaggeration of the normal effects of stimuli when transmitted to and transformed in the spinal cord, but it would be best to call this character of reflex "spreading."

6. The amount of movement of the limb or of the muscle may be increased. This appears to me to be the best use of the term exaggerated. In using the term in this way, it must be remembered that there are wide differences of the movement in health, and a number of factors influence the apparent extent of move-

ment. Considering the knee-jerks, for example, if the relative positions of the foot before and at the height of the reflex contraction be taken to indicate the extent of movement, it is obvious that a patient with a longer lower leg will normally have a greater excursion than will a shorter-legged patient. It is clear, therefore, that the angular amount of movement is here the only true measure of the extent.

7. Finally, the reflex instead of being a simple contraction and relaxation may have a tonic, clonic or mixed character. There may be a large movement followed by one or two other movements, usually small, which resemble clonus; there may be a movement persisting for a long period of time, and there may be a combination of the tonic and clonic movements.

The term diminution of reflex may be used to include the opposites of the conditions which are described above in sections 1, 2, 3, 4, 5 and 6.

It is not so easy to determine the absence of reflex as many practitioners believe, for careful testing will often disclose the presence of a reflex which was presumed to be lacking.

In the comparisons that follow, the terms "exaggeration" and "diminution" are considered to be used by all investigators in a similar although loose manner, and it is assumed that the experience and reputations of the different reporters are such as to warrant accepting their use of the terms "absent" and "normal."

In Table I, will be found the records of the character of the

TABLE I.—CHARACTER OF THE KNEE-JERK IN PARESIS.

Reporter and date.	Total number cases.	Number of cases.				Percentages.			
		Absent.	Dimin.	Normal.	Exagg.	Absent.	Dimin.	Normal.	Exagg.
Beatley, 1885.....	70	18	15	11	26	25.7	21.4	15.7	37.1
Siemerling, 1886.....	151	42	5	46	58	27.8	3.3	32.5	36.4
Ziehen, 1887.....	51	11	3	5	32	21.6	5.9	9.8	62.7
Bevan Lewis, 1889.....	37	10	5	6	16	27.0	13.5	16.2	43.3
Gudden, 1894.....	1316	252	55	506	503	19.1	4.2	38.5	38.2
Cramer, 1896.....	198	66	31	31	70	33.4	15.6	15.6	35.3
Baird, 1905.....	199	40	25	39	95	20.1	12.6	19.6	47.7
Hunt, 1905.....	55	17	2	1	35	30.4	3.6	1.8	64.3
Ricksher, 1907.....	65	5	18	7	35	7.7	27.7	10.7	53.8
Franz, 1908.....	158	38	30	20	70	24.0	19.0	12.7	44.3
Totals and percentages.....	2301	499	180	675	938	21.7	8.2	29.3	40.8

knee-jerk in 2301 paretic patients to which I have contributed 158 cases. The results and percentages are classified, it will be observed, as absent, diminished, normal and exaggerated. The work of the different investigators reported in this table I have gone over carefully and have recalculated wherever it was necessary. This table is to be compared with Tables II and III, the results in which will be described below. From this table I have excluded the reports by different investigators of cases "not observed." The totals of cases included only the "observed" cases and the percentages are also based on the total "observed" cases. I have not based the percentages, as some have done, on the total number of admissions which may have been considerably in excess of the total number in which the character of the reflex was recorded. In doing this it has been necessary to change quite freely in some instances the percentages noted by different authors, but wherever this has been done, it is for the reason stated above, or for very special reasons that will be noted below. For example, from Hunt's account of 60 cases examined in the Vanderbilt Clinic, it might be supposed that he gives the percentages of absent, normal, diminished and exaggerated knee-jerks in the total number; but a careful consideration of his percentages shows the percentages are based on a total of 56 cases, although he does not state this explicitly in his article. In a similar way, Cramer apparently reports results from 220 cases of paresis and he gives the following percentages of the different character of reflexes: normal, 14; absent, 23; exaggerated, 30; diminished, 14; slightly exaggerated, 2; unilaterally absent, 7; not determined, 5. Lacking definite statements of the condition in the 5 per cent of individuals which are apparently not reported, we must exclude from consideration at least 10 per cent, namely, 22 cases, which includes the 5 per cent which Cramer reports "not determined" and the 5 per cent of which he makes no mention. When the 10 per cent are excluded, we have to deal with only 198 cases instead of 220, as Cramer appears to do in his article. When the extra cases are eliminated, we find the percentages altered, not much to be sure, but the result of the percentages based on 198 cases are: normal, 15.6; absent, 25.8; exaggerated, 33.3; diminished, 15.6; slightly exaggerated, 2; and unilaterally absent,

7.6. It appears to me to be self-evident that the exclusion of the "non-determined" and the "not recorded" is justified, for unless this be done, we have artificial figures which in extremes become absurd and justify the statement that figures may be used to prove anything. To consider as an example of this vicious method, I may cite the results of my investigations of the reflexes in the 248 paretic patients who died in the Government Hospital for the Insane during the past eight years. Some of the records of the earlier admissions did not contain full accounts of the reflex findings beyond "nothing greatly abnormal"; "reflexes exaggerated"; or "reflexes not elicited," and I do not feel justified in view of these general but unsystematic statements in assuming that the knee-jerks had been specifically tested in each case, and in assuming that in all cases the knee-jerks corresponded in character to the above sweeping designations in the case records. In only 158 of the more recent cases of paresis were the reports sufficiently specific to make it plain that they should be included in the series. The percentages obtained from this number are as follows: absent, 24; diminished, 19; normal, 12.7; exaggerated, 48.8. Had I included in this table, the extra 90 cases, the percentages would be: absent, 15.3; diminished, 12.1; normal, 8.1; exaggerated, 28.2; not determined, 36.3; a thoroughly unjustified and unnecessary proceeding. It is not my intention, therefore, to change the figures of previous authors to support any preconceived notion or personal hypothesis, but solely to obtain the nearest approximation to truth.

The totals show that about two-fifths of paretics have exaggerated knee-jerks; one-fifth absent and one-tenth diminished knee-jerks. In seven of the ten investigations reported in this table, the percentages follow fairly closely these general percentages. In the reports of Ziehen, of Hunt and of Ricksher, the exaggerations are more numerous with a corresponding decrease in the reports of normal knee-jerks by Ziehen and Hunt and a decrease in the report of absent knee-jerks by Ricksher. In all three authors, however, the number of cases is small and the chance variation of two or three in any one figure means a considerable variation in the percentage. Hunt's series is anomalous in comparison with the others, in that so few cases of normal and

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diminished knee-jerks were observed. Assuming the accuracy of the observations, this must be purely a chance occurrence, although it may be due to the character of the patients that present themselves at the Vanderbilt Clinic. Such percentages, we know, are not obtained with hospital patients, and in the Moscow Clinic more nearly normal average results were obtained, as will be seen from the results in Table III.

Table II gives the results from 1337 additional cases of paresis recorded by three investigators. In their works, Siemerling, Renaud and Wollenberg group the absent and diminished knee-jerks, and for this reason their results could not be classified in Table I. It is possible that this grouping of absent and diminished knee-jerks is justified, for the diminution and loss of knee-

TABLE II.—CHARACTER OF THE KNEE-JERK IN PARESIS.

Reporter and date.	Total number cases.	Number of cases.			Percentages.		
		Absent and dimin.	Normal.	Exagg.	Absent and dimin.	Normal.	Exagg.
Siemerling, 1887...	345	129	90	120	37.4	27.9	34.8
Renaud, 1893.....	482	68	68	348	14.1	13.7	72.2
Wollenberg, 1894..	610	124	123	263	24.3	24.1	51.6
T'tals and percent..	1337	321	285	731	24.0	21.3	54.7

jerks may be due to a similar cause or to similar causes, and the differences may be evidence only of the degree of pathological change. This method of grouping, however, needs to be justified by a careful investigation, and at present it is open to criticism. It is not uncommon to find in certain cases variations from diminished to normal, or often from diminished to an exaggerated knee-jerk and the reverse, but it is unusual to find the return of the knee-jerk after it has been lost. That the latter does occasionally occur is known, but the scarcity of these cases and, on the other hand, the facility of change from diminished to normal indicate a functional difference between the diminished and absent knee-jerks which may properly be assumed to indicate a difference in cause of the two phenomena. In comparison with Table I there is a marked difference in the percentages of the exaggerated knee-jerks, the increase in Table II being at the expense of the normal and the absent knee-jerks.

The original articles in which were recorded the results given in Table III, I have been unable to obtain, and the results are known to me only in the records of the work of other authors. The results from the Moscow Clinic by Gaunouchkine are taken from Hunt's article, where it is stated that the percentages are based on "about 500 cases." Taking the percentages as given by Hunt, and assuming that Gaunouchkine reported fully 500 cases, I find that there is a probable total of 459 cases in which the reflexes were observed. von Scarbo's results are calculated from the report of his work in the *Neurolog. Centralblatt* and from the report of the work by Ricksher. Ricksher assumes that von Scarbo found only 15 per cent of normal knee-jerks in his 115 cases (reduced to 99 when the "extras" are omitted), and while I

TABLE III.—CHARACTER OF THE KNEE-JERK IN PARESIS.

Reporter.	Total number cases.	Number of cases.			Percentages.		
		Absent and dimin.	Normal.	Exagg.	Absent and dimin.	Normal.	Exagg.
Gaunouchkine	459	144	62	253	31.4	13.5	55.1
v. Scarbo.....	99	23	17	59	23.2	17.3	59.6
Greppin	26	12	4	10	46.2	15.4	38.5
Totals and percent	584	179	83	322	30.6	14.2	55.1

have used this figure as the basis of my calculation of the number of cases and of correcting the percentages, I believe it is doubtfully correct. In the *Centralblatt* it is stated that von Scarbo found 15 per cent of normal knee-jerks in 38 per cent of absent tendo Achillis reflexes, but it is reasonable to presume that not all normal knee-jerks were found associated with the absent Achillis reflexes.

I have, therefore, grouped the results of these three investigators separately and give them only as confirmatory evidence of the more carefully collected figures in Tables I and II. The results of Table III, it will be noted, confirm in general the results in Table I, but the percentage of exaggerated knee-jerks is reported to be greater and the percentage of normal to be less. In view of the divergence of method in testing the reflexes and of the probable differences of conception of what may be meant by the terms "exaggerated" and "diminished," it appears to me that the differences in the tables are not so marked that they would in-

dicate great differences in the reflexes in peoples of different countries and occupations or that they permit us to assume the observers were not equally good. When the results presented in the three tables are grouped, it is evident that approximately two-fifths to one-half of the cases of paresis may be expected to have exaggerated knee-jerks, and the remainder may be equally divided between normal and diminished (including absent) knee-jerks. The totals for the three tables are: normal, 1035; exaggerated, 1986; diminished and absent, 1178; grand total, 4199 cases; and the percentages of the different reflexes are as follows: normal, 24.6; exaggerated, 47.3; diminished and absent, 28.1.

II. LATENT PERIOD OF EXAGGERATED AND DIMINISHED KNEE-JERKS.

In reports of cases of paresis, the knee-jerks and other reflexes are often entered as "quick." This is probably meant to indicate an exaggerated condition, but observations made by me make it appear certain that the time of the reflex is not easily determined by the eye; and that the validity of the use of the word quick for the word exaggeration needs investigation. In previous work on the time of the reflex in the retardation of manic-depressive insanity, I found from some experiments that the latent period was prolonged, although it was impossible to determine this from simple examination. In this earlier work, the method of investigation was not so good as that employed in the present work, and the average time obtained cannot be directly compared with what has been obtained in this investigation.

In the present research there were selected for the tests eight paretics whose reflexes had previously been determined by the clinical men of this institution. One of the eight showed decreased knee-jerks and the remaining seven had "lively," "active," "quick" or "exaggerated" reflexes. So far as I could determine from eye inspection, all the exaggerated reflexes were quick; and the knee-jerks in the individual in which they were diminished were apparently slow. Short histories of these patients follow:

Bu., age 32. Duration of the disease at the time the experiments were made, about three months. Reported having contracted syphilis one year

previous to entrance, but this statement cannot be relied upon. Patient was confused and unintelligible, irritable and excitable on admission, but since that time, quiet and orderly. He is careless of his personal appearance. Consciousness is clouded and he is disoriented for time, person and place. His memory is very poor. Hallucinations were not admitted, but his actions indicate that they are present. There are delusions of wealth, which are not very prominent, and of an absurd character. There is no insight. Speech is ataxic and there is difficulty in repeating test phrases. There are marked tremors of hands, fingers and lips. There is no apparent impairment of co-ordination, although there is muscular weakness on the right side. The knee-jerks are exaggerated, the left being greater than the right. The tendo Achillis reflexes are absent on both sides. Triceps are exaggerated and no ulnar or radial reflexes are elicited. No ankle or wrist clonus. Plantar and epigastric reflexes are normal. Cremasteric is very slight. The jaw-jerk is exaggerated. Pupils are regular, the left larger than the right; both react promptly to the usual tests.

Hk., age 27. In his case syphilis was denied, but admitted by him at times, and in conversation he has said, "Dr. R. gave me a douche and gave me syphilis." The duration of the disease (paresis) at the time of the experiment was about two years. Memory is very poor. He does not know the people he has seen every day for weeks. Reasoning and judgment are considerably impaired. There is a marked clouding of consciousness and the patient has many complete and absurd somato-psychic delusions. He is restless and often noisy. Emotional tone is lowered. He is very erotic. He takes no interest in things about him. He is as untidy as he can be with the attention of the nurses and attendants. He has no insight. He speaks little and when he does it is unintelligible. His speech is slurring with the omission of words and syllables. There is general weakness of the muscular system. There is a general tremor. There is a marked inco-ordination of the hands and arms. He walks fairly well, but a trifle unsteady. The knee-jerks and tendo Achillis reflexes are exaggerated. The triceps, ulnar and radial reflexes are exaggerated, the left more marked than the right. There is no ankle or wrist clonus. The plantars are equal and well marked and there is no Babinski sign. The cremasterics are diminished and there is no epigastric reflex. The pupils are dilated, equal and react slowly to light and accommodation. Consensual reaction is difficult to induce. He has had two periods of convulsions since entrance to the Hospital.

Hr., age 37. Probably syphilitic. Duration at time of experiments, one year and eight months. Patient was inaccurate in work, and had somewhat faulty reasoning. He was quiet and orderly and assisted on the wards for seven or eight months after entrance, and, although allowed to go to town unattended, was slightly demented. In his case there have been no delusions or hallucinations. He has had no insight and a recent clinical note says that "patient says little except when spoken to, and then is rather non-communicative. He talks in an explosive manner and elides many syl-

lables. He knows the character of the institution; believes he was sent here to be treated for nervousness. He has an excellent memory for past and recent events, his times and places of enlistment in the army, his places of service, the ward in which he has been in the hospital, and he appreciates all that goes on about him. He has no ideas of grandeur or depression." He has had no convulsions or apoplectic attacks up to this time. Patient shows tremor of the tongue and extended fingers and well marked speech defect. There is considerable ataxia of the legs, more marked in the right one, and when descending and ascending the stairway, right foot wavers and trembles like a clonus when it is lifted. Knee-jerks are exaggerated, but at times diminished.

Hu., age 38. No evidence of syphilis, and infection denied. Duration about five months. Mother was insane and a brother led a wild and dissolute life. At the hospital showed at times a picture of apprehensive depression, and believes people are calling him a horsethief and a murderer. Is careless of his personal appearance and dress. He stays in one place for hours at a time. He walks slowly and rather hesitatingly. There is apparently great mental reduction. When talking his voice is tremulous, uncertain and he omits syllables and leaves off word-endings and there is a decided drawl. Tremors about the lips are prominent when he stumbles over a difficult word. Grip is good and equal in both hands. Co-ordination fair in arms and legs. No Romberg symptoms. Gait is slovenly, but it cannot be said to be ataxic. The tendon and skin reflexes are exaggerated. Pupils, right slightly irregular, both dilated. Reaction to light slow and small in amount. Accommodation reaction slow. There have been no convulsive or apoplectic attacks since entrance to the hospital, and no history of previous ones.

Le., age 31. Syphilitic history; date of infection unknown. Duration of mental disease, three years. Patient is irascible, morose, visionary and incapable of managing his own affairs. At one time there were well marked hallucinations, and delusions which still persist. Facial expression is apathetic. There is clouding of consciousness and memory defect for recent events. Patient has grandiose ideas, but is inconsistent in that he expresses a desire to return to his former employment as a clerk. He is careless of his personal appearance; his habits are dirty. He had for some time parole of the grounds and assisted with the ward work. He is mentally unstable. There is no insight into his condition. His speech defect is marked. He drawls words, syllables and occasionally stammers. His pupils are dilated, both are slightly indented. There is a slow reaction to light. Consensual reflex is practically absent on both sides and there is no accommodation reaction. There are tremors of tongue and lips and recently tremors of the hands have been noted. Knee-jerks are equal, exaggerated. The tendo Achillis jerks are exaggerated. Elbow and wrist-jerks are normal. There is no clonus of the ankle or wrist. Plantar reflexes are normal in amount and there is no Babinski. Cremasteric and epigastric reflexes are normal. The gait is a trifle shuffling, but

not particularly characteristic. This patient has had no convulsions or epileptiform attacks, but he has had crises which may be considered their equivalents.

Mg., age 31. Syphilitic infection ten years ago. Mental disease began four years previous to experiments. Patient is cheerful, exalted, but with no apparent delusions of grandeur. He is irritable at times and occasionally strikes other patients when they do things he does not like. He has a typical dementia relation to his surroundings. He does not seem to care where he is, and the only insight he shows is when his wife and child (three years old) come to visit him and when other patients annoy him. He sometimes throws himself on the floor and kicks as a child does. No hallucinations or delusions have been elicited. Speech is slurring and stumbling, many words are omitted without any attempt at correction, and at times he is nearly incoherent. When excited the thickness of speech is very much pronounced. He writes weekly letters to his wife, which are unintelligible. He has no insight. Pupils, medium in size, left greater than the right. Light reaction absent on the left. No consensual on the left. Both accommodation reactions normal. Light reaction in right is slow and slight in amount, and the right consensual is normal. Muscular tremors are pronounced. Marked ataxia is noted when patient tries to take off or put on his clothes. The knee-jerks are exaggerated. The tendo Achillis reflexes are normal. The triceps and wrist reflexes are exaggerated. There is no clonus of wrist or ankle. Stimulation of the soles of the feet shows Babinski's sign on both sides. Cremasteric reflexes are diminished. The epigastric reflex is normal. There have been no convulsions or apoplectiform seizures since entrance to the hospital, but he had before entrance one apoplectiform attack which shows at the present time by a ptosis of the left eye.

Sg., age 38. Syphilis probable, but not definitely known. At the time of the experiments, duration of the mental disease was about one year and eight months, although five years previous he had had a maniacal attack of some kind, the character of which is unknown, since he was not at that time placed in a hospital. At first patient was talkative and slovenly, but at the time the experiments were made, he was rather non-communicative and rather neat. His memory is greatly impaired; his attention is poor, and his apperception ability is defective. His general attitude is indifferent or a trifle elated. He had some delusions of wealth, but not beyond what such an individual might have—a few thousand dollars. He is not disoriented to person, place and time. He has no insight. He slurs and stumbles over words, elides syllables and leaves off endings. He stammers and at times is unable to pronounce a word, but gives it up without having made any great effort to pronounce it correctly. Test phrases are very badly pronounced. Although he passed through grammar school, he gave incorrectly much of the multiplication table. Some stigmata of degeneration are apparent. Lymphatic glands are enlarged. No muscular aberration, although there are tremors of the face and tongue. Co-ordina-

tion is poor in both upper and lower extremities. The gait is shuffling and a mild degree of Babinski sign is present. The knee-jerks were reported abolished at the time of the first examination, but they were present at the time of the laboratory experiments, although greatly diminished. There are no tendo Achillis reflexes; the triceps normal; no clonus of wrist or ankle. Stimulation of the sole of the foot gives an exaggerated defense reaction and, in addition, a cross adduction reflex. Cremasterics are normal, but the epigastrics are absent. The pupils are of medium size, equal but irregular, and eccentrically placed. Direct and consensual light reactions are absent. There is diminished accommodation reaction. Sympathetic reaction is absent. There have been no convulsions or epileptiform attacks, but he has had occasional crises, after which he appears confused.

Tu., age 50. Syphilitic history denied. This patient shows a considerable degree of dementia and memory is almost a blank. He is disoriented; answers irrationally and incoherently. No delusions or hallucinations could be elicited. He is emotionally indifferent; is quiet and orderly and does what he is told to do. There is no insight. There is coarse tremor of extended fingers, and at times some twitchings of muscular groups. Co-ordination is somewhat impaired, and there is a slight Romberg sign. The gait is ataxic and very unsteady. He has to be assisted to walk about. The grip is diminished. Speech is ataxic, and there are tremors of lips, tongue and facial muscles. Knee-jerks are exaggerated. Tendo Achillis reflexes are normal. Triceps and wrist reflexes are exaggerated. No clonus of wrist or ankle. Plantar, cremasteric and epigastric reflexes are normal. All the patellar reactions are apparently sluggish.

Description of Apparatus.—The patient rested in a comfortable supine position on a couch and the lower legs were allowed to hang freely over the edge of the couch at an approximate right angle to the upper leg. The couch was so high that the lower edge of the patella was 75 cm. from the floor and movement of the leg of the longest-legged individual was not interfered with. Movement of the leg was determined indirectly by means of the contraction of the quadriceps muscle. Before any experiments were made, points were located on the skin over the quadriceps of each leg where palpation indicated a maximum of muscular thickening.¹ These points were marked with an indel-

¹ Bloch and Tschirjew have independently demonstrated that the contractions of the quadriceps take place simultaneously all over, and during the reflex there is no wave of contraction from the tendon upward through the muscle. In placing the tambour, therefore, on the point of greatest contraction the time of the latent period is not artificially increased in these experiments.

ible pencil, later with silver nitrate, and the button of a receiving tambour was always placed at these receiving points. Similar points were also located on the skin over the patellar tendon, in order to keep the place of stimulation constant.

The apparatus holding the stimulating hammer was movable. The framework was constructed similar to that of a guillotine. It was 104 cm. high. In the center of the top and at a right angle, was a piece projecting 24 cm. beyond the frame to hold an electromagnet for retaining and releasing the hammer. The hammer for stimulating the patellar tendon was hung on pivots so as to swing freely. It is 28 cm. from the pivots to a point corresponding to the center of the striking surface. On the handle of the hammer was a piece of iron that makes it possible for the electromagnet to be used for holding and releasing the hammer. The head of the hammer is made of rubber in two pieces, one attached firmly to the handle, the other moving sufficiently to make a contact.² The moving or contact part of the hammer is attached to a brass head which passes through the larger part of the hammer head. In striking any surface, the lower or contact part of the hammer approaches the upper part and there is a possibility of a movement of about 3 mm. The contacts were so arranged that a very little movement, from a millimeter to a half of a millimeter, sufficed to make the contact and the rest of the movement, about 2.5 mm., was sufficiently large to prevent the breaking of the contact after it had been once made. Wires were carried from the contact through the hammer handle and were attached to binding posts on the framework. From these, wires were led to a signal magnet and a battery. When the contact was made by the hammer striking the tendon, the time was registered on a rapidly moving smoked drum.

The button of a receiving tambour was placed over the point of the leg that was to be tested and the tambour was firmly fixed. This receiving tambour was 6.5 cm. in diameter. Rubber tubing led to the recording tambour which was 5 cm. in diameter and which had about one-third the air capacity of the receiving tam-

² It may be well to state that Castex found the surface of the percussion hammer had no effect upon the character—exaggeration or diminution—of the reflexes.

bour. A light straw lever attached to the recording tambour magnified the recorded excursions of the rubber membrane fifty times.

The time record was made by the style of a Jacquez chronometer beating fifths of a second. The drum of a Ludwig kymograph was revolved as rapidly as possible; during the revolution the hammer was dropped, made its contact which was recorded on the drum; the knee-jerk was recorded by the tambour; and the time record in fifths of seconds was also recorded. The time of the latent period was determined in individual contraction by averaging the lengths of three successive fifths of seconds and comparing with this average the difference in the time between the stimulation of the tendon, indicated by the signal magnet, and the beginning of the muscular contraction as indicated by the record of the recording tambour. The latent period for the air transmission from the receiving to the recording tambour was determined in a series of experiments, to be .0035 second. In the calculation of results this figure has been subtracted. In arranging the tambour lever, the time record and the signal record, it was found advisable to place the point of the tambour lever some distance ahead in order that there should be no interference, since by placing it either above or below, there was a possibility of interference when the lever moved in the wrong direction. The illustrations which are given show records in which the recording lever has been placed 9.5 mm. ahead of the styles of the chronometer and the signal magnet.

Results of Experiments.—Fig. 1 illustrates the records obtained, and also the general character of the reflex movements. This record gives parts of three curves from *Hk*. The record is to be read from right to left. The tambour curve is below the corresponding time and signal curves. In this record the tambour curve preceded by 9.5 mm. the record of the signal magnet and that of the Jacquez chronometer. It will be noted that at the time the tendon was struck, there is a slight depression in the tambour curve, followed by a correspondingly slight rise to the normal position, then a deep and rather steep decline which corresponds to the contraction of the quadriceps in producing the knee-jerk. The lower part of the curve is wavy. This character I have found

in most of the curves which I have obtained but its significance I do not know. The uppermost of the three curves shows that the lever of the recording tambour rose to a position above its normal, and later returned to the normal position. This part of the record does not show the phenomena so clearly as it is shown in Fig. 2. The curves indicate, however, that there may be, and often is, a tonic relaxation following the contraction. The relaxation is often followed by a second contraction. This is well shown in Fig. 2, in which the record has been made when the drum was revolving slowly. Often a third and fourth contraction have been found.

Fig. 2 is also a record from *Hk.*, and there is the same amount of lateral displacement, namely, 9.5 mm., between the tambour and time record.

In the case of *Le.*, the records indicate clearly that there was a uniform antagonistic action following the knee-jerk. The records show that the relaxation of the quadriceps was greater after the knee-jerk than when the leg hung loosely from the edge of the couch and when the knee was bent approximately at a right angle. This condition is not so well marked in the record which is here produced as in many other records of *Hk.*, but the antagonistic tonic after-effect to a greater or less extent was found in almost all the records of *Le.*, *Hk.*, *He.*, *Mg.* and *Bu.* In *Bu.*, the time of the persistence of the working of the antagonistics was approximately .6 of a second; in *Le.*, it was .4 of a second, while in the records of others, it averaged from .1 to .4 of a second.

The duration of the knee-jerks in the records of *Hk.*, is approximately one-twelfth second, although in Fig. 2, it appears to be somewhat longer. In the records of other subjects, the time varies considerably, sometimes amounting to as much as one-fifth second, and in these cases the term exaggeration cannot be taken to mean a rapid movement, contraction and relaxation.

Table IV, gives the results of the average latent period of the knee-jerk in the eight cases of paresis which I have investigated. In the first vertical column are the initials of the subjects; the second column, note of which leg was used; the third column gives the average time in seconds; then the average variation of the experiments in that particular series, and in the last column,

we have the number of experiments in the series. The average time of all subjects is about .050 second. This is the average of 495 experiments, and in this total we have included the experiments or averages of the one case in which the reflexes were diminished, namely, *Sg.* It will be noted, in looking over the totals, that *Sg.* has an average latent period of .051 second. This is very close to the general average, and is not far from many of the figures which are given by the other subjects, all of whom showed decided increase in the amount of movement of the foot.

TABLE IV.—TIME OF LATENT PERIOD OF KNEE-JERK IN PARESIS.

Subjects.	Leg.	Average time in second.	Average variation in second.	Number of experiments.
<i>Bu.</i>	R.	.057	.0060	16
	L.	.048	.0070	16
<i>Hk.</i>	R.	.061	.0061	42
	R.	.060	.0081	39
	L.	.040	.0036	34
	L.	.037	.0026	39
<i>Hr.</i>	R.	.064	.0068	19
	L.	.064	.0065	30
<i>Hu.</i>	L.	.044	.0042	19
<i>Le.</i>	R.	.056	.0069	45
	R.	.054	.0020	8
	L.	.048	.0054	23
	L.	.046	.0039	33
<i>Mg.</i>	R.	.057	.0041	27
	L.	.039	.0046	46
<i>Sg.</i>	R.	.051	.0057	19
<i>Tu.</i>	R.	.061	.0064	16
	L.	.060	.0073	24
Average and total.....		.050		495

The difference in the time for the two legs came out plainly in the cases of *Hk.* and *Le.*, on each of whom there were two series for each leg, and in both series the same differences were noted. These differences I cannot explain. So far as can be determined, there is no difference in the other characters of the knee-jerk in these individuals to account for the quicker time on the left than on the right. A similar difference is noticeable in the averages for *Mg.* In this case only one series of experiments was made, but the difference is very pronounced. *Hr.*, on the contrary, showed slower time on the left; *Bu.* showed slower time on the right; *Tu.* was approximately the same on both sides.

These results are to be compared with the time measurements of the knee-jerk in normal individuals. Several investigators have found that the time of the latent period of the knee-jerk in normal people is from .024 to .069 second. It should be noted, however, that the methods which were employed in these other investigations differ considerably from those which I have employed, and the results cannot, therefore, be directly compared with the experiments which are here recorded. For the sake of comparison, I made two series on normal individuals, one of 36 experiments in which the average time for the knee-jerk was .04 second, and in another individual, the average time for 51 experiments was .044. If these times be considered normal, we may say that the results obtained from *Mg.* and *Hu.*, and the experiments on the left leg of *Hk.*, are absolutely normal in respect to latent period. It will be observed that the time of the knee jerk in most of the other patients is longer than that of normal subjects. It seems evident, therefore, that the knee jerks in exaggerated condition are not properly always spoken of as quick, and, in fact, that the latent time of exaggerated knee-jerks may be lengthened.

In this connection, the question whether the knee-jerk is a reflex or a contraction due to mechanical stimulation might be discussed, but it need not detain us here to any extent. The great objection which has been raised to considering the knee-jerk a true reflex, is that the latent time is too short, that is, the time from the moment of stimulation until the beginning of the contraction. This conclusion is based upon the determination of the time of transmission of nerve impulses in the motor nerves, especially of frogs, but it appears to me that we are not justified in taking these experiments as a basis for the criticism of the reflex time. The rate of nerve impulse in a motor nerve of a frog has been determined to be from 30 to 33 meters per second. It is likely that human motor nerves have a much faster rate of transmission, and we know that the rate at least in human sensory nerves may be about 60 m. per second. If we take for comparison the lowest probable rate in human motor nerves to be 40 m. per second, the probable rate in human sensory nerves to be 60 m., and then consider the time taken up in the spinal cord to be .012 to .022 sec., in accordance with the recent experiments of

Buchanan, the necessary total time for the reflex—omitting from consideration any inertia in the end organ and the latent period of the muscle, which is very small—would be from .029 to .039 sec.

III. RELATION OF KNEE-JERK TO OTHER CONDITIONS IN PARESIS.

From time to time attempts have been made to correlate various findings in paresis with each other and with the probable duration of life once the disease has been recognized. Some of the ideas put forth will be mentioned in the proper paragraphs, but we may note here that Thurman, for example, concluded from an examination of eye conditions in 116 cases, that the dilatation of the right pupil corresponds to depressive states, and that dilatation of the left is most often accompanied by expansive conditions. The knee-jerks have often been correlated with the mental and physical condition in small numbers of patients. One of the most sweeping generalizations is that of Shaw, to the effect that exaggerated reflexes are associated with marked speech disturbances, with apoplectiform attacks and with comparatively few epileptiform convulsions. All of the conclusions and ideas put forth on these subjects cannot be considered at this time but in the form of a preliminary attempt at some simple correlation I have constructed tables of the relation of the knee-jerk and some other phenomena in paresis.

Knee-Jerk and Ankle Clonus.—Results of the examination of 96 patients on whom tests for both knee-jerks and ankle clonus were made, are included in Table V.

TABLE V.—KNEE-JERK AND ANKLE CLONUS.

Character of knee-jerk.	Absent.	Dimin.	Normal.	Exagg.	Totals.
Ankle clonus present.....	0	2	0	13	15
Number of observations.....	21	15	14	46	96

Ankle clonus is considered to be rather uncommon in paresis, but it would seem that about 15 per cent showed sufficient evidence of this condition, so that it has been recorded. In this case it is likely the true percentage is much lower than 15, since many

examiners are accustomed not to mention clonus unless it is found to be present. It is possible that this has been the custom of those who prepared the records of the cases which I have examined. It will be noticed that a greater percentage of the occurrences of ankle clonus is found in conditions of exaggerated knee-jerks.

Knee-Jerk and Plantar Reflex.—From a study of this subject, Bettencourt concluded that the exaggeration of the tendon reflex is accompanied by the loss or a diminution of the plantars in the majority of cases, but that this is not always so is shown by the tables giving the results of Renaud's and my observations.

TABLE VI.—KNEE-JERK AND PLANTAR REFLEX (RENAUD).

Character of knee-jerks.	Character of plantar reflexes.			Totals.
	Absent.	Normal.	Exaggerated.	
Exaggerated	78 = 24%	132 = 40%	120 = 36%	330
Normal	"As often preserved as exaggerated."			7
Absent.....	30 = 57%	14 = 21%	15 = 22%	63

TABLE VII.—KNEE-JERK AND PLANTAR REFLEX.

Character of knee-jerks.	Character of plantar reflexes.				Totals.
	Absent.	Dimin.	Normal.	Exagg.	
Absent.....	2	6	22	6	26
Diminished.....	2	4	18	1	25
Normal.....	0	0	16	0	16
Exaggerated.....	3	2	41	10	56
Totals.....	7	12	97	17	133

In considering the plantar reflex, we are met with the difficulty that this reflex is not so simple as the tendon, epigastric or cremasteric reflexes. Two different reflexes are present when the sole of the foot is stroked and are called plantar. The stimulation of the plantar surface of the foot is followed by movements of the foot and toes; secondly by extensive movement of the legs, and at times by movements of other parts of the body.

The movements of the legs and other bodily parts, may be spoken of as the "defense" reaction. They usually accompany the peculiar organic sensation or feeling of tickling, and are un-

doubtedly directed toward effecting escape from the irritation. These movements may be widespread, they may be localized in a few muscles, or they may be entirely absent. With these classes of response the reflex may be respectively called exaggerated, normal or absent. Comparative statistics of this kind of plantar reflex, I have been unable to discover.

The downward or flexor movements of the toes is similar in character to the flexion of the fingers and hand of a baby when an object, such as a pencil, is placed across the fingers or palm. It is probably a relic of arboreal ancestry and is a grasping reflex. A marked difference of the reflex, viz., extension, especially of the great toe, is found in many organic nervous diseases, but this cannot be described as normal; in this case the plantar reflex is not diminished, nor is it exaggerated; it is of a different character.

From this analysis of the so-called plantar reflex it will be understood that we are dealing with a complex reaction, and that unless the accounts of the reflexes are full we are unable to differentiate the two or three kinds of reflexes classed under the name of plantar and it is almost impossible to make correlations. The terms exaggeration, diminution and absent may be applied equally well to the flexion or to the tickling reactions, but reports of exaggerated or diminished plantar reflexes must always be accompanied by doubt as to the character of the reaction that is abnormally great, for unless specific mention is made of the kind of plantar reaction that is exaggerated, we are unable to say whether it is the defense reaction or the flexion.

The figures in Tables VI and VII, are open to the above criticism. It should be noted as significant, however, in both of Renaud's tables and in the reports which I have correlated, the normal knee-jerk was never found to be associated with diminution or absence of the plantar reflex.³

Knee-Jerk and Cremasteric Reflex.—The cremasteric reflex is often absent or diminished in paresis, and the tentative examination of the relation of the changes in this reflex with the different character of knee-jerk is given in Table VIII.

³ I have here assumed, although it is not expressly stated that Renaud found no diminution or absence of the plantar associated with normal knee-jerks; for he says, in speaking of the normal knee-jerk, that in association with this condition, "the plantars are as often observed (normal) as exaggerated."

TABLE VIII.—KNEE-JERK AND CREMASTERIC REFLEX.

Character of knee-jerk.	Character of cremasteric.			Totals.
	Absent.	Dimin.	Normal.	
Absent.....	6	7	8	21
Diminished.....	3	3	11	17
Normal.....	2	2	7	11
Exaggerated.....	5	7	30	42
Totals.....	16	19	56	91

In none of the case records which I have examined has the cremasteric reflex been described as exaggerated. In the case of this reflex, we have no standard by which to judge exaggeration unless we consider the time of the apparent rapidity of the reflex. Complete measurements and statistics of the cremasteric reflex are not known to me. In view of the high percentages of cases in which it was noted as absent or diminished, it should be carefully investigated. It will be noted that the cremasteric was absent or diminished in about 35 per cent of all cases in which specific mention was made that tests were made of this reflex.

Knee-Jerk and Pupillary Reaction.—It is very properly said that the combination of Argyll-Robertson pupils, absent knee-jerks and signs of dementia in an individual of twenty-five to forty-five years of age, indicates over 99 per cent probability of a diagnosis of paresis, if other known organic nervous disease is not evident. Carefully collated statistics are wanting of the occurrences of this combination in other mental diseases not of known organic origin. It is probable that the diagnosis of paresis would be justified, not only from a combination which is mentioned above, but from simpler combinations, such as changes in the knee-jerks and the loss of sympathetic or consensual reflexes. These different combinations, however, have not been carefully gone over.

TABLE IX.—KNEE-JERK AND PUPILLARY LIGHT REACTION.

Character of knee-jerk.	Character of light reaction.			Totals.
	Absent.	Dimin.	Normal.	
Absent.....	18	9	6	33
Diminished.....	4	13	7	24
Normal.....	3	6	11	20
Exaggerated.....	15	23	15	53
Totals.....	40	51	39	130

Light Reaction.—In Table IX, is given an account of the relation of normal, diminished and absent direct light reaction with the different characters of knee-jerks. The percentage of loss of the direct light reaction in paresis is quite high. If we combine the diminution with the absent conditions it is approximately 70 per cent.

TABLE X.—KNEE-JERK AND NORMAL LIGHT REACTIONS.

Recorders and dates.	Totals.	Number of cases.			Percentages.		
		Absent.	Normal.	Exagg.	Absent.	Normal.	Exagg.
Siemerling, 1886.....	49	6	25	18	12	51	37
Wollenberg, 1894.....	210	31	64	115	15	30	55
Franz, 1908.....	46	12	11	23	26	24	50
Totals and percent..	305	49	100	156	16	33	51

Table X, in which are included the results of Siemerling and of Wollenberg, gives the association of the normal pupillary reactions to light with different characters of knee-jerks. This table gives the result of 305 observations and it shows that normal light reaction is less often associated with absent knee-jerks than with conditions of exaggeration and normal. In this table I have grouped all my observations—6 absent and 6 diminished—under the heading of absent, as Siemerling and Wollenberg have doubtless done. From Renaud's work, I have found that in 166 cases of normal pupillary light reaction, 18 were found associated with

TABLE XI.—KNEE-JERK AND ABSENT LIGHT REACTIONS.

Recorders and dates.	Totals.	Number of cases.			Percentages.		
		Absent.	Normal.	Exagg.	Absent.	Normal.	Exagg.
Siemerling, 1886.	94	36	24	34	38	26	36
Renaud, 1893.....	316	50	24	242	16	8	76
Wollenberg, 1894.....	249	80	64	105	32	26	42
Franz, 1908.....	36	17	3	16	47	8	45
Totals and percent..	695	183	115	397	26	17	57

absent knee-jerks; 42 with normal knee-jerks; and 106 with exaggerated knee-jerks. These figures give percentages similar to those given by Siemerling and by Wollenberg.

In Table XI are given the results in which knee-jerks are associated with light-stiff pupils. It will be noted that the greatest number is found associated with exaggerated knee-jerks. In this

table the results of my observations are given of only those cases in which no light reaction was obtained. From the statistics given by Siemerling, by Renaud and by Wollenberg it appears that they have included among their light-stiff pupils those cases in which a minimum or a diminished reaction was observed. If a similar procedure were followed in connection with my cases, instead of being 17 with absent knee-jerks, 3 with normal knee-jerks and 16 with exaggerated knee-jerks, there is a total of 70 cases of which 25 light-stiff pupils were found associated with absent knee-jerks, only 8 with normal knee-jerks and 37 with exaggerated knee-jerks. If, in addition, under the general heading of absent knee-jerks there be included the diminished knee-jerks, there would be a total of 87 light-stiff pupils, of which number 42 were associated with absent and diminished knee-jerks; 8 with normal knee-jerks and 37 with exaggerated knee-jerks.

TABLE XII.—KNEE-JERK AND ACCOMMODATION REACTION.

Character of knee-jerk.	Accommodation reaction.			Totals.
	Absent.	Dimin.	Normal.	
Absent.....	5	7	20	32
Diminished.....	6	16	13	35
Normal.....	0	2	17	19
Exaggerated.....	9	15	39	63
Totals.....	20	40	89	149

Accommodation Reaction.—Results of the correlation of the observations of the accommodation pupillary reaction with the knee-jerks in 149 cases are given in Table XII. Here also it will be noted that the least percentage of absent accommodation reaction is associated with normal knee-jerks, the greatest with absent and diminished knee-jerks.

TABLE XIII.—KNEE-JERKS AND PUPILLARY REACTIONS.

Character of knee-jerk.	Argyll-Robertson.		Diminished light and accommodation.	Absent light and accommodation.	Normal light and accommodation.	Totals.
	Complete.	Incomplete.				
Absent.....	13	5	3	4	6	31
Diminished.....	1	3	10	3	6	23
Normal.....	3	3	2	0	11	19
Exaggerated.....	10	8	13	6	23	60
Totals.....	27	19	28	13	46	133

Argyll-Robertson Pupils.—In Table XIII, are found statistics for the correlation of Argyll-Robertson pupils with the different characters of knee-jerks. I have included in this table the cases in which there is complete Argyll-Robertson pupils, the incomplete Argyll-Robertson, in which accommodation is normal and the light reaction diminished or slowed; the combination of diminished light and accommodation reactions, absent light and accommodation reactions, and normal accommodation and light reactions. In conjunction with this table, it should be mentioned that Renaud has found 242 cases of complete or incomplete Argyll-Robertson pupils among 348 cases of exaggerated knee-jerks; 24 cases among 66 normal knee-jerks, and 50 cases among 68 absent knee-jerks. The table shows that the Argyll-Robertson pupil, both complete and incomplete, absent or diminished light and accommodation reactions are seldom associated with normal knee-jerks. They are most often associated with absent and diminished knee-jerks. Fifty-eight per cent of the cases showing normal knee-jerks also showed normal light and accommodation reactions. No case was found in which the normal knee-jerks were associated with the absence of both light and accommodation reflexes, there were 6 cases in which the normal knee-jerk was associated with complete or incomplete Argyll-Robertson pupils and only 2 cases associated with diminished accommodation and light reactions. Of the total 133 cases examined, 35 per cent gave normal reactions to light and accommodation; 21 per cent gave diminished reaction to both light and accommodation; 10 per cent did not react to light or accommodation; and 14 per cent showed incomplete and 20 per cent complete Argyll-Robertson pupils. When we compare these figures with the percentages found in exaggerated reflexes, we find the percentages to be almost exactly similar—38 per cent normal; 22 per cent absent for both reflexes; 13 per cent incomplete, and 17 per cent complete Argyll-Robertson pupils. It appears, therefore, that in relation to the exaggerated knee-jerks the distribution of the anomalous eye conditions in the exaggerated patellar reflexes follows the same sort of distribution as if the eye reflexes in paresis be considered as a whole. In connection with the absent patellar reflexes, however, we find considerable alteration, for we have only 19 per cent of these cases showing normal light and accommodation reaction;

10 per cent diminished and 13 per cent absent light and accommodation reflexes; 16 per cent incomplete and 42 per cent complete Argyll-Robertson pupils. It is certain, therefore, that there is a much closer association or correlation between the absent knee-jerk and the Argyll-Robertson pupil than between the latter and any other condition of knee-jerk.

Knee-Jerks and Mental Symptoms.—Mention has already been made of an attempted correlation between reflexes and mental conditions. Rouillard has reported that in paresis the exaggeration of the tendon reflexes appears in the expansive form and the abolition of the reflexes in the depressed form. On the other hand, Marandon de Montyel affirms that the knee-jerks are more often exaggerated in the depressed form of paresis. Renaud ex-

TABLE XIV.—KNEE-JERKS AND MENTAL TYPES.

Character of knee-jerk.	Mental types.			Totals.
	Exalted.	Depressed.	Demented.	
Absent.....	9	10	13	32
Diminished.....	14	1	11	26
Normal.....	10	3	5	18
Exaggerated.....	24	18	25	67
Totals.....	57	32	54	143

amined 107 cases for this correlation and found exaggerated knee-jerks in 66 per cent of expansive cases of paresis and in 68 per cent of depressed cases. Normal knee-jerks were found by him in 13 per cent of the expansive form, and 17 per cent of the depressed type; while absent knee-jerks were found by him in 21 per cent of the expansive cases and in 15 per cent of the depressed cases.

In 143 cases which I have gone over I find approximately 40 per cent were exalted or expansive, 22 per cent were depressed, and the remainder were of the demented type of paresis. I have left out those few cases in which there were alternations of exaltation and depression. It will be found in looking over the table that there is no special correlation between the knee-jerks and the mental condition. This conclusion is brought out more clearly when the figures for the absent and the diminished knee-jerks are combined.

Knee-Jerk and Duration of the Disease.—There appears to be more of a correlation between the character of the knee-jerks and the duration of the disease. It is impossible in every case to determine the duration of the disease before entrance to the hospital, but it is fair to assume that on an average all types and characters of patients are brought to the hospital at approximately the same stage of the disease.

In Table XV I give the average duration of the disease in this hospital in 148 individuals in whom the knee-jerks were also examined. In view of the uncertain time of the previous duration, the accuracy of the reports depending upon the sincerity and helpful attitude of the patients' relatives, I have preferred to take the hospital residence, since this is accurately determinable. The table shows very clearly that the average duration of life of pa-

TABLE XV.—KNEE-JERK AND DURATION OF DISEASE.

Character of knee-jerk.	Absent.	Diminished.	Normal.	Exaggerated.	Average.
Average duration in months.....	13.6	19.3	21.9	20.2	19.4
Number of cases.....	36	30	19	69	148

tients with absent knee-jerks, after they enter the hospital, is a little over a year. Those in whom the reflex is only diminished, live about a year and a half, and about the same time for the exaggerated reflexes. Those patients who showed normal knee-jerks live approximately two years. The average variation of these figures is, of course, very large. I have not calculated this, but some idea may be gathered from the fact that the upper and lower limits in the different conditions are as follows: the patients exhibiting absent knee-jerks lived from 0.5 to 53.5 months; those with diminished knee-jerks from 0.5 to 85 months; those with normal knee-jerks from 1.5 to 36 months; those with exaggerated knee-jerks from 1.0 to 110 months. An examination of the original figures shows that should the exceptionally long-lived individuals be excluded, there would be a quite marked diminution in the expectancy of life in the individuals who, on entrance to the hospital, have absent knee-jerks. With so few cases it may, perhaps, be more justifiable to consider the median observations closer approximations to the expectancy of life than the averages

which are given in the table. It may be well to state that the median value for patients with absent knee-jerks is 11.25 months; with diminished knee-jerks, 13.25 months; with normal knee-jerks, 15.5 months; and with exaggerated knee-jerks, 15.5 months. In these cases the correlation is more likely one of the relation of general bodily conditions on entrance to the hospital. We are dealing probably with the correlation of the amount of involvement of the brain and spinal cord, which is supposed to be greater in conditions of absent knee-jerks than in conditions of diminished, exaggerated or normal knee-jerks. These figures are to be compared with the statements of Cramer, who, however, does not give averages or specific figures for any of the different conditions. This author states that the absence of knee-jerks in paresis makes possible a prognosis of long duration and few and slight stages of agitation. On the other hand, the averages which are here reported make probable a prognosis of short duration in absent and diminished knee-jerks and of a longer duration in normal and exaggerated reflexes.

CONCLUSIONS.

1. In over 4000 patients, the percentages of different character of knee-jerks are as follows: normal, 24.6; exaggerated, 47.3; diminished and absent, 28.1.
2. The antagonistic muscular action following the knee-jerk is greater than the agonistic action.
3. In many cases of paresis, the knee-jerk is clonic in character.
4. The time of the knee-jerk, i. e., the continuation of the muscular contraction, is from 0.1 to 0.6 second.
5. The average latent period of exaggerated knee-jerks in cases of paresis is slightly longer than in normal individuals.
6. The average latent periods in conditions of exaggeration and diminution do not appreciably differ.
7. There is often a difference in the latent period of the knee-jerk of the two legs of a subject, which is not distinguishable clinically, and which is not yet correlated with other functional or with structural changes in the nervous system.
8. Fifteen per cent of the patients that were examined showed ankle clonus in one or both legs.

9. Ankle clonus was not found associated with normal or absent knee-jerks.

10. No special relation was discovered between the condition of the plantar reflexes and the knee-jerks, although with normal knee-jerks the plantar was never diminished or absent.

11. There is a decided correlation between Argyll-Robertson pupils and absent knee-jerks. There is also a decided negative correlation between the alternation of pupillary reactions and normal knee-jerk, in that the pupillary abnormalities are less often found associated with normal knee-jerks.

12. There is no relation between the character of the knee-jerk and the mental symptoms, although a relation has previously been reported by at least two other investigators.

13. It appears that on entrance to a hospital the expected duration of life of paretic individuals with absent knee-jerks is about 13 months; that of patients with diminished knee-jerks is about 19 months; and that of patients with exaggerated or normal knee-jerks, about 20 months.

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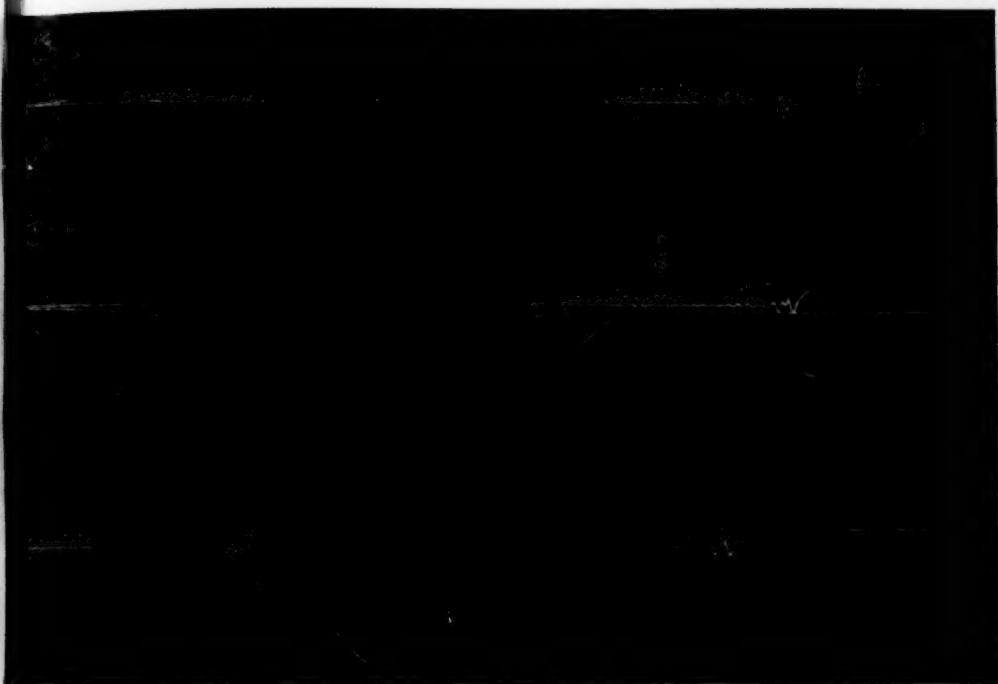


FIG. 1.—Curves of movement of quadriceps muscle in knee-jerk. To be read from right to left. The upper line of each curve gives the time in fifths of a second. The middle line shows the time when the patellar tendon was struck. The lowest line gives the time of the contraction of the quadriceps. The contraction curve is 9.5 mm. ahead of the time curve.



FIG. 2.—Curve of movement of quadriceps muscle in knee-jerks. For description see the legend to Fig. 1.

A CONSIDERATION OF THE NEED OF BETTER PROVISION FOR THE TREATMENT OF MENTAL DISEASE IN ITS EARLY STAGE.¹

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In 1902 was opened at the Albany Hospital a pavilion for the treatment of mental diseases to which patients might be admitted without formality and with the same freedom as those received in the wards for the sick and injured. It was proposed to meet the needs of certain cases of incipient or transitory mental disturbance for which no provision was otherwise made. If insanity threatened it was the practice in Albany, as elsewhere, to temporize until symptoms developed requiring judicial consideration, when legal proceedings were taken and the patients committed to an institution for the insane. If the patient became violent or dangerous he was not infrequently sent to the county jail pending his transfer to proper care, and the inhumanity of this, illustrated by some disastrous occurrences, emphasized the need of greater consideration of the necessities of these unfortunate persons.

The undertaking was a modest one, but has unexpectedly attracted attention as an innovation, probably because in public and professional opinion the management and control of the insane have long been associated with decrees of the courts of law and not infrequently with criminal proceedings. The medical relations and status of insanity have been lost from sight.

Among the visitors to Albany to whose notice this department was brought was Dr. McIntyre, the chairman of your committee of arrangements for this meeting, and to his interest and courtesy I am indebted for the compliment conveyed in the invitation to address your society. This is an especially gratifying recognition of the work done in the Albany Hospital, not only as coming from

¹ Read by invitation of the Committee on Scientific Work at the annual meeting of the Medical Society of the State of Pennsylvania, held at Cambridge Springs, September 14-17, 1908.

the representative medical body of another state, but because Pennsylvania is pre-eminent in medical science and in progress in the care of the insane.

It may not be out of place to recall that the first and oldest hospital of this country, the Pennsylvania Hospital in Philadelphia, obtained its charter mainly on the representations in the petition therefor, of the needs of persons "Distemper'd in Mind and depriv'd of their rational Faculties," and it is noteworthy that at that early day, 1751, the pathological nature of insanity was recognized in the effort to provide a hospital for "the cure and treatment of lunaticks," in order that "they may be restored to reason and become useful members of the community." Not until forty years after were the reforms of Pinel in France and Tuke in England accomplished, though from their humane efforts is popularly dated the modern era in the care of the insane. But insistence upon the fundamental truth that the insane are sick, which stands to-day unmodified and unassailable, must ever remain the glory of the first hospital of the United States.

The medical practice of that day differed from ours, and in the light of our science may be susceptible of criticism, but it was available for the sick in mind as freely as the sick in body, if the distinction be permissible, and when Pinel and Tuke were relieving physical conditions which were a blot upon their civilization, Benjamin Rush was engaged with the scientific observations which resulted in the first medical publication by one of our countrymen on the subject of mental diseases. His recommendations were far in advance of his time and his book is still a classic in our literature.

In 1841 the wards for the insane in the Pennsylvania hospital were abandoned, and the original buildings received surgical and general medical cases only. The mental patients were transferred to the new special department in West Philadelphia. The reasons for this are indicated in the records of the hospital, and are particularly: first, the accumulation of patients who failed to recover; and, secondly, the inconvenience of a divided or interrupted authority, which occurs in general hospitals upon the quarterly rotation of attending physicians. When one visits the beautiful grounds and wards of the Pennsylvania Hospital for the Insane,

it may be easily seen that no departure from the benevolent purpose of its founders has been made.

The separation of the insane from the bodily sick was inevitable and was necessitated by conditions which could not be otherwise met. But though the work done by modern hospitals for the insane is of high order the unfortunate discrimination has not been favorable to early treatment, and the number of chronic cases has become so large as to paralyze efforts for cure. The state is overwhelmed by the constantly increasing and expensive burden, and the overcrowded institutions are essentially custodial. Sanitary dwellings, comfortable beds, proper food are provided, and diversion and occupation are utilized for the contentment of the patients, so that their lot is greatly improved over the neglect and abuse incident upon county care in almshouses and jails.

The time has come for another step in advance. Insane patients may be divided into two classes, those revealing an inherent or congenital defect of mental development, and those who break down under the stress and exactions of life. The latter may be regarded as possessing normal minds which have succumbed to disease, usually some form of exhaustion or toxæmia, or both. They require and respond to proper treatment. By neglect they pass on to incurable dementia and swell the number of helpless incompetents. Law and custom make no distinction between these two classes. It is the practice in the larger commonwealths to place a state hospital in each of several districts, into which the state is divided, and to this hospital to "commit" the patients from the district. The "commitment" is made by a judge or magistrate, and no patient may be received or detained without the judicial order, and no patient may obtain this order until his mental symptoms have become so pronounced as to warrant the court in making the order, for the preservation of the public peace, or the safety of the patient. Cure and restoration are matters of chance. From the medical standpoint this reflects a less enlightened age than our own. In no other department of practice would it be tolerated. It may properly be regarded as analogous to refusal to treat a case of pulmonary tuberculosis before the formation of a cavity; and such a rule, if applied to cases of tuberculosis, would be a repudiation of all efforts recently made to intercept the

ravages of this disease in its incipency. Yet this neglect of the only promising stage of mental disease has been quietly accepted by the profession, notwithstanding the efforts made by hospitals for the insane to popularize their special knowledge by the adoption of laboratories and other sources of investigation common to general medical practice. The results of laboratory work, it is true, have been negative, but this may be regarded as fortunate, in so far as it points the way to another field.

For the first suggestion toward better treatment tribute must be again paid to Pennsylvania and its famous hospital. In a paper read before the American Medico-Psychological Association in 1882, and published by the State Board of Charities, Dr. John B. Chapin, Medical Superintendent of the Pennsylvania Hospital for the Insane, directs attention to the custodial character of state institutions, and proposes the organization at each of a small hospital block for the active treatment of recoverable cases. He says:

"In every institution for the insane are to be found a certain number of cases of acute mania with exhaustion, acute delirious mania, nervous prostration with incipient mental disorder, insomniac conditions, cases of melancholia, which in respect to the prospect of recovery from mental disorder or a prolongation of life may be said to be in a critical condition. They are misplaced in the ordinary wards, surrounded as they are by all of the disadvantages to which allusion has been made. They may be feeble, extremely susceptible to noises, suicidal, and need an unusual amount of personal attendance for their proper care, as well as much tact and persistence in their management. They may require, and should have, if necessary, two or three attendants available for their care every twenty-four hours, and the medical superintendent might properly organize a special service composed of the best trained attendants for this class. All of this service can be best provided for in a detached hospital block convenient of access to the medical superintendent, and under the care of a medical officer assigned to the building. The number of patients for whom this special accommodation would be required would not be large, and rarely exceeds five per cent. The plan should provide for complete isolation of a patient if necessary; rooms arranged and constructed so that all noise and confusion existing in other wards could not be heard; and so accessible that a patient could be received into the hospital and in some cases even discharged, without contact with the unpleasant scenes, discomforts and depressing associations of which some properly complain before and after their discharge."

The class of patients enumerated by Dr. Chapin is susceptible to treatment and restoration to health. The conditions which lead

to insanity are social and personal, and cannot be met by wholesale preventive methods such as may be applied to contagious and epidemic diseases. The community may purify its water supply and wipe out typhoid fever; it may quarantine and disinfect diphtheria, scarlet fever and tuberculosis, and stay the ravages of these diseases. But no comprehensive or universal decree reaches the victims of the stress and worries of life, the financial difficulties and domestic incompatibilities usually concealed, the anxieties, distresses, discouragements and despair which slowly undermine the nervous resistance and are not revealed until some sudden and critical mental explosion results.

It may now be said that recovery from mental disease is to be sought in the application of clinical methods to early cases, and in this only.

This suggestion, unheeded for sixteen years, now promises to bear fruit. In New York it is proposed to add to the state hospitals separate buildings for the active treatment of recent cases of insanity, and the lunacy law has been amended to permit the reception of patients who apprehend insanity, or, in an incipient stage seek relief. Clinical methods and an active ward service are to be adopted. The great benefits to be derived from this plan cannot be underestimated. The large institutions will become less custodial in character, and the medical staff are to be stimulated by the study and treatment of the individual, to which the physician has been consecrated since the days of Hippocrates. It is a matter for deepest regret that the humane purpose of large institutions is not more generally appreciated, and that their conscientious medical officers, laboring patiently under great responsibilities, should be isolated from their colleagues. There are no greater monuments to our calling than the institutions for the insane, and every effort toward hospitalization and the recognition of insanity as disease should be encouraged and emphasized.

But when all this has been done, and the state has provided for the care of helpless chronics and the restoration of acute cases, an obligation remains upon the general hospital. Recognition of this by the physicians and local authorities led to the organization of the department for mental diseases at the Albany Hospital. The state hospital to which patients were sent was seventy-five miles

away, and delay and lack of facilities were accompanied by many hardships and abuses. The hospital consisted of a series of pavilions connected by corridors and the arrangement permitted the addition of a separate building for mental cases. It was proposed to place under the general administration patients under commitment awaiting transfer to the state institution, and to provide wards for observation when the need of commitment was undetermined.

The pavilion was added to the rear of the nurses' house, in a position somewhat remote from the general activities of the hospital. It is a two-story building, the first floor for women and the second for men. It is designated "Pavilion F" in conformity with the notation adopted for the other pavilions of the hospital, thus avoiding a distinctive name. Each floor is divided into two departments, that quiet and turbulent patients may be separated, and special attention has been given to the architectural plan, that restless cases may not disturb others, and yet may receive constant attention.

Much of the best work has been done in the care of these active cases, who present a state of critical exhaustion. It is particularly desired that the requirements of each patient be met properly, and that coercive measures which might prove harmful are not used under the vicious plea of expediency.

The administration is based upon that of other departments, except that the attending physician has continuous service, and is held to strict accountability to the governors of the hospital. He is assisted by two internes on the medical service whose duties are the taking of histories and examination of patients under his direction. The nurses of the training school have the care of both men and women patients, and are required to spend at least ten weeks of their three years' course in the mental wards. They are under the direction of a head nurse who has had special training, and are assisted by orderlies on the ward for men. To the high character of the service rendered by the nurses is attributed much of the success attained, and their duty seems to be entered upon willingly and with enthusiasm. The tact and toleration developed by familiarity with mental cases is an important element in the education of the nurse, and the obligation between the training school and the mental wards is reciprocal.

From February 18, 1902, to August 1, 1908, 1332 patients have been admitted. Of these 765 have returned to their homes recovered or much improved, 446 have remained stationary, and 106 have died. Three hundred and ten have been transferred to institutions for the insane: of these 183 were sent to Pavilion F for detention during the legal proceedings, and 126 were committed after a period of observation. It thus appears that 1038 patients have been under treatment without legal process, 183 of whom it became necessary to commit later. If this special provision had not been made then these 1038 patients would either have had to be treated at home, or legally committed after a probably harmful development of the disease.

It has been noted that many neurotic persons who yield temporarily to stress and overstep the proprieties of home life, are restored to a reasonable mental equilibrium, sometimes in a few days, so that they may return to the care of their friends.

A better educated public sentiment, higher ideals of responsibility to the afflicted, strong family ties, now demand the best known means for cure. The family demoralized by the insanity of one of its members, and ready to expend every effort for restoration, does not look with favor upon statutory requirements based upon disproved theories of abuse, injustice and conspiracy. Where the law is obstructive it is not an uncommon practice to send patients to some other state, for there is great reluctance on the part of their friends to air their troubles before a magistrate and to engage in a proceeding which they believe will prove a lasting embarrassment—sometimes referred to as a "family stigma"—should the patient be restored to participation in affairs. This public sentiment now promises to become so pronounced as to produce an effect in lunacy legislation, that less stringent lunacy laws be enacted, and that the lunacy system of a state be not erected into a barrier against every exercise of compassion, sympathy and scientific progress. So Goldsmith's meditative *Traveller* cried:

"How small, of all that human hearts endure,
That part which kings or laws can cause or cure!"

Indeed, it is difficult to understand why a man who is delirious from the effects of some obscure organic poison should be required to obtain a lawyer and an order of the court before neces-

sary treatment, when another likewise unconscious and incompetent from another better known poison, as the typhoid bacillus or pneumococcus, may be sent to a general hospital without question and there detained, willing or unwilling, without any process of law, until recovery takes place.

Hospitals for the insane should approach as nearly as possible the standards of general hospitals, and general hospitals should be allowed and encouraged to receive without restriction mental cases, and should provide for their patients the standards of care established for surgical and general medical cases. The bugaboo of abuse should be relegated to the limbo it so justly deserves. It is difficult to conceive how unjust and cruel practices can prevail in a general hospital. Situated in a community providing its support, accessible to visitation at all times, controlled usually by a board of representative and philanthropic citizens, satisfactory standards cannot fail to be maintained.

An important revelation through the experience at the Albany Hospital has been the recognition by the patients of their own mental disorder, apprehension as to its outcome, and anxiety for treatment. In a very small number of cases has there been any complaint of detention. There are, however, a few patients who resist any restriction of personal privilege and decline to remain. Under such conditions the case is presented to the court for adjudication, and the hospital assumes no responsibility. If a declaration of insanity and a commitment follow, the patient is sent to a duly authorized institution for the insane.

The work of a hospital for the insane cannot be done in a general hospital; nor can the work of a general hospital be done in a hospital for the insane, but there are forms of mental disorder having the character of an acute illness, and there are many forms of acute disease with disturbance of mental function, for which the general hospital should provide.

In conclusion the following principles may be stated:

(1) Many cases of mental disease present symptoms of exhaustion and toxæmia, which place them in the class of acute general diseases, and, as they are as amenable to treatment as these, they should be dealt with accordingly.

(2) Many cases of acute physical disease and many surgical

cases are complicated by mental symptoms, the cause of which may not be clear.

(3) Incipient and doubtful mental cases have a legitimate claim for treatment upon the general hospital.

(4) Special wards are needed in general hospitals for the care of acute mental cases, whether idiopathic or complicating medical or surgical disease.

(5) These wards should be so situated and so constructed that the mental cases should neither be disturbed by the activities of the general ward, nor in turn prove an annoyance.

(6) The value of treatment near home, and of the presence of friends and co-operation of friends of patients cannot be over-estimated.

(7) The training of hospital internes and nurses and familiarity of the public with mental diseases are most important educating influences.

(8) General hospitals should be permitted and encouraged to receive mental cases until the limitation of their resources or the probable incurability of the patient has been reasonably established.

APPENDIX.

CHAP. 261.

AN ACT to amend the insanity law, relative to the parole of patients in State hospitals and the voluntary care and treatment of patients therein.

Became a law, May 11, 1908, with the approval of the Governor. Passed, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Subdivision two of section seventy-four of chapter five hundred and forty-five of the laws of eighteen hundred and ninety-six, entitled "An act in relation to the insane, constituting chapter twenty-eight of the general laws," as amended by chapter twenty-six of the laws of nineteen hundred and two, and chapter four hundred and ninety of the laws of nineteen hundred and five, is hereby amended to read as follows:

2. Any patient who is not recovered but whose discharge, in the judgment of the superintendent, will not be detrimental to the public welfare, or injurious to the patient; provided, however, that before making such certificate, the superintendent shall satisfy himself, by sufficient proof, that

friends or relatives of the patient are willing and financially able to receive and properly care for such patient after his discharge. When the superintendent is unwilling to certify to the discharge of an unrecovered patient upon request, and so certifies in writing, giving his reasons therefor, any judge of a court of record in the judicial district in which the hospital is situated may, upon such certificate and an opportunity of a hearing thereon being accorded the superintendent, and upon such other proofs as may be produced before him, direct, by order, the discharge of such patient, upon such security to the people of the State as he may require, for the good behavior and maintenance of the patient. The certificate and the proof and the order granted thereon shall be filed in the clerk's office of the county in which the hospital is situated, and a certified copy of the order in the hospital from which the patient is discharged. The superintendent may grant a parole to a patient not exceeding six months, under general conditions prescribed by the commission. The commission may, by order, discharge any patient in its judgment improperly detained in any institution. A poor and indigent patient discharged by the superintendent, because he is an idiot, or a dotard not insane, or an epileptic, not insane, or because he is not a proper case for treatment within the meaning of this chapter, shall be received and cared for by the superintendent of the poor or other authority having similar powers, in the county from which he was committed. A patient, held upon an order of a court or judge having criminal jurisdiction, in an action or proceeding arising from a criminal offense, may be discharged upon the superintendent's certificate of recovery, approved by any such court or judge.

Sec. 2. Article three of the insanity law is hereby amended by adding at the end thereof a new section to be known as section seventy-nine, and to read as follows:

Sec. 79. *Voluntary Patients in State Hospitals.*—Pursuant to rules and regulations established by the State commission in lunacy, the superintendent or person in charge of any State hospital for the care and treatment of the insane, except the Matteawan and Dannemora State hospitals, may receive and retain therein as a patient any person suitable for care and treatment, and who voluntarily makes written application therefor, and whose mental condition is such as to render him competent to make such application. A person thus received at such hospital shall not be detained under such voluntary agreement more than five days after having given notice in writing of his intention or desire to leave such hospital. The superintendent or physician in charge of such hospital shall, within three days after the admission of a patient by such voluntary agreement, forward to the office of the commission, the record of such patient in accordance with the provisions of section thirteen of this chapter, and such rules and regulations as may be established by the commission.

TRAUMATIC AMNESIA—A CASE OF MEDICO-LEGAL INTEREST.*

BY W. W. RICHARDSON, M. D., NORRISTOWN, PA.

The case of Frank Endrukat, who was tried for murder in the Philadelphia courts in December, 1907, is believed to be unique from a medico-legal standpoint, and is for that reason reported to this Association.

The following is the patient's story as he tells it at the present time. It is practically the same as told many times previously to others.

Frank Endrukat was born in Germany of healthy parents. He knows of no mental nor nervous taint in his ancestors. He is the seventh child of a family of seven, none of whom showed abnormalities or nervous disease. When he was two years old the family moved to Russia, where he was reared.

Endrukat and the girl, Martha Corias, whom he murdered, were school-mates in Russia and early became attached to each other. Upon reaching manhood he became a newspaper correspondent. He states that at times he and the girl traveled together, registering at the hotels as man and wife, but that at this period there was nothing improper in their relations.

When the girl was eighteen years old, they decided to marry, but the father of the girl repeatedly refused his consent on the ground of religious differences.

On the morning of May 16, 1905, he went to the girl's house to renew his suit. Before he saw the father, the girl avowed her intention to kill herself if the father refused his consent. The father did refuse and, when Endrukat returned to the girl with this news, she turned pale and he heard her say, "This is the murderer's moment." He thought from this remark that she was going to kill herself, and, as he was wearing his military pistol (being in the Russian Army at that time), he drew it and shot her twice. The father rushed in with a hatchet at the shots. Endru-

* Read at the sixty-fourth annual meeting of the American Medico-Psychological Association, Cincinnati, May 12, 1908.

kat shot him, wrenched the hatchet from his hand, struck the girl several times over the head and then shot himself in the neck. (In corroboration of this part of the story it may be said that he carries a large scar at this point.)

The girl recovered, but the father died four days later. After lying in the hospital ten months, Endrukat was tried and sentenced to two and one-half years imprisonment. His sentence, however, was lightened by the Douma and, further, he was one of the prisoners freed to celebrate the birth of an heir to the Czar, so that he actually served only eleven days in prison.

Shortly after the girl recovered she sailed for America. He heard of this and in December, 1906, also came to the United States, though not, he claims, with any idea of finding the girl.

He landed at Baltimore, came to Philadelphia and learned, quite by chance and with surprise, that the girl was in the city, knew of his arrival and wished to see him. They met and became very intimate; in fact spent several nights together. One such night was spent in his room, and on this occasion he showed the girl a large sum of money (\$800) which he had.

After she left, he found that his money was missing and later accused her of the theft. She gave him an evasive answer and, as he had heard that she intended to leave the city with his money and another man, he had her arrested on a charge of larceny. She retaliated by lodging a charge of rape against him, claiming that she had been detained against her will at his room and, through threats of death, had been dishonored. They later met in court, an exchange of money took place, each charge was withdrawn and they separated. This occurred on April 24, 1907, and Endrukat claims that he never saw the girl after that date.

He states that on the date of the murder, April 29, he rose about 9 a. m., breakfasted, remained about the house until 2 o'clock p. m., took the street car for the Pennsylvania Hospital to be treated for rheumatism, was admitted and put to bed. After he had been there three days he was restrained mechanically. Upon inquiring the reason for this he was told that he was insane. In addition, police officers were kept near him day and night. On May 28 (one month after the homicide) a woman acquaintance visited him, told him of the murder of Martha Corias; that he

had killed her and shot himself. This, he claims, was the first he knew of the death of the girl.

The actual facts in regard to the homicide, as developed at the trial are these:

At about half-past seven o'clock on the morning of the 29th of April Martha Corias was in a bakery, buying bread. As she started to leave, Endrukat entered and addressed her in German. She said, "let me go," and upon this he drew his revolver, shot her twice, then shot himself in the right temple.

The girl died almost immediately and he became unconscious at once.

The testimony of the physicians as to his history while at the Pennsylvania Hospital is briefly as follows:

Patient was brought in, unconscious, at 8 a. m. A bullet wound was evident in the right temporal region. This wound was enlarged under ether about 11 a. m. and was found to penetrate the temporal bone just back of the orbit, the bone being depressed and somewhat comminuted at this point. Brain substance exuded from the opening in the skull. As moderate probing failed to locate the bullet, the wound was closed with gauze drain.

The patient regained consciousness about 8 p. m. (12 hours after the shooting) and was able to recognize a friend who called. Nothing coherent, however, could be learned from him at this time. In answer to a question as to the shooting of the girl he gave a somewhat confused reply to the effect that he had not killed her.

For about two weeks he lay in a semi-conscious condition with intervals of more complete consciousness. During this period he at times was critically ill. Soon, however, he began to gain; his wound healed rapidly and his only complaint three weeks after the injury was double vision.

About this time a skiagraph was taken, disclosing a bullet in the left temporal region. (Unfortunately, the plate has been lost and I could get no more definite information than this.)

He refused permission for an operation to remove the bullet, refusing to believe that the skiagraph shown to him was taken from his own head. His conduct while in the hospital revealed no abnormal features. His answers to questions, especially when

relating to the crime, were irrelevant or evasive, though not incoherent.

When told by the woman visitor, one month after the homicide, of what he had done, he denied all knowledge of the matter and volunteered that the police officers who were watching him were there because he was thought to be crazy.

After his refusal to have a further operation he was soon (June 7, 1907) sent to prison, being convalescent.

Endrukat remained in prison six months awaiting trial. During this period he was repeatedly questioned by his attorneys and by medical experts in an effort to make him admit some memory of his crime. To all he said emphatically that he did not kill Martha Corias; that he couldn't have killed her, as he was in another part of the city on the day of the murder, as he could prove by his friends. When questioned about the bullet wound in his temple he said he had had a cancer, which was cut out at the hospital. He laughed about the bullet in his brain and said that a man couldn't live with a bullet in his head.

His conduct while in prison is stated to have been natural in most respects, though he manifested irritability at times, especially if other prisoners were noisy. The prison physician testified that there was nothing in his conduct or speech while in prison to make him think that the prisoner was of unsound mind.

At the opening of the trial (December 12, 1907) the court considered a petition from the defendant's attorneys asking that an inquiry be first made into the state of mind of the prisoner, it being averred that Endrukat had no recollection of his crime and for that reason could not comprehend the proceedings, could not properly confer with counsel nor make a rational and proper defense. However, the defendant, in answer to the court's questions, stated that he knew he was in a court-room and that he knew he was charged with killing Martha Corias. The court then overruled the petition of the defense, directed that a plea of "not guilty" be entered for the defendant, and the trial proceeded.

There was no contention in regard to the facts of the killing, as detailed above, which were proven by the commonwealth.

For the defense, several witnesses were first called who had been associated with the defendant at the hospital and prison, to

confirm the contention that the prisoner had never at any time admitted any knowledge of his deed. An attorney who had formerly been connected with the case testified that the prisoner had told him of having several thousand dollars at his disposal, which money was at the house of a friend. However, this friend could not be found at the address given.

The main reliance of the defense was upon expert testimony. The first expert called for the defense testified that in his opinion the defendant was suffering from traumatic amnesia, covering the period of the commission of the crime as a result of the gunshot wound. The following question was asked him by the counsel for the defense:

"Assuming that lunacy, as used in Section 67 of the Act of 1860 (Statutes of Pa.) is defined to be the inability of the prisoner to understand and comprehend sufficiently his position to be able to confer with counsel and prepare a defense; assuming that and assuming that the prisoner has traumatic amnesia, would you consider that that person is a lunatic within the meaning of the word as I have defined it in this question?"

The answer was: "In my opinion he would be." He further testified that, outside of his traumatic amnesia, he saw no evidence of mental abnormality in the defendant.

On cross-examination, he stated that the fact that the prisoner refused to accept the testimony of creditable witnesses that he had committed the crime served to differentiate this case from one of simple alcoholic amnesia and suggested more impairment of mind than mere traumatic amnesia. He felt that the defendant did not realize the gravity of the proceedings or comprehend fully the situation in which he was placed. He thought that, having no knowledge of his crime, the prisoner was not competent to conduct his defense.

The other alienist for the defense was also asked the hypothetical question embodying the definition of lunacy as given above and answered that he regarded the defendant as a lunatic "in that broad meaning." He thought the defendant comprehended his surroundings and the proceedings as far as a foreigner could and that he could reason properly about all matters save the crime itself, of which he remembered nothing. He also thought that

a man could not confer with counsel and prepare a defense for a crime about which he knew nothing.

Two experts were called in rebuttal by the commonwealth.

The first witness testified that, from his examinations of the prisoner, it was his impression that the loss of memory was real, though he knew of no way to prove it. There was one point, however, in which, if real, this amnesia differed from most cases of a traumatic character and that was in the fact that the prisoner had fabricated a series of events to fill in the lapse of memory (or part of it).

He qualified his answer to the hypothetical question of the defense, defining lunacy as the inability to confer with counsel, etc., by saying that he thought the defendant fully able to confer with counsel as to his defense unless the term "confer with counsel" meant that he must necessarily remember his deed. If the latter interpretation were the right one, then he must answer as did the witnesses for the defense. He felt that the defendant was much above the average grade of intelligence and was not insane in any sense of the term.

The testimony of the second expert for the commonwealth was briefer and practically the same in the opinions expressed as that just given.

The charge of the court tended toward a verdict of murder in the first degree as far as the crime itself was concerned. The court, however, charged rather strongly in favor of the prisoner as far as related to his mental condition at the time of the trial. The following points were incorporated in his charge, at the request of counsel for the defense.

1. "If you believe that the defendant's mental condition is such that he cannot confer with counsel or prepare his defense, you must find him a lunatic."

2. "For you to find that the defendant is competent to advise with counsel and prepare his defense, you must believe from the evidence that the defendant has *personal knowledge of the commission of the crime* and has sufficient knowledge and memory of the facts and circumstances attending the alleged crime to make a defense thereto."

3. "If you find that the defendant is suffering from or is

afflicted with *traumatic amnesia* and in consequence thereof has no knowledge or recollection of the facts of the crime whereof he is charged, then your finding should be that the defendant is a *lunatic* and *mentally incompetent* to advise with counsel and prepare his defense."

With these points included in the charge, it can readily be seen that if the jury gave heed to the court's charge there was little left to do but to declare the man a lunatic at the time of the trial.

The jury rendered the following verdict: "The defendant, Frank Endrukat is guilty of murder in the first degree, also he is now a lunatic and unable to confer with counsel in regard to the tragedy."

After some two months further spent in prison, Endrukat was finally sent to the State Hospital for the Insane at Norristown, Pa., by order of court. It was reported from the prison that he had grown very violent and he admitted to us that on one occasion he had become very angry and destroyed some furniture in his cell because they would not permit him to see the superintendent of the prison about some matter.

Physical examination on admission at Norristown revealed no evidence of organic nervous lesion of any kind, nor of any other organic disease. He presented no marked stigmata of degeneration, and the contour of his head, facial expression and method of carrying himself showed him to be above the average man in general intelligence. Apart from a few minor ailments, his health has been excellent. He has complained at times of mild headache, but has had no vertigo nor other subjective symptoms. He states that he has never had convulsions of any sort; there is no history or evidence of venereal disease and he claims to have been a very moderate drinker (which his appearance confirms).

After admission he very readily gave the story of his life as told above. He is polite and deferential in manner and at no time has shown irritability of temper. He has shown a tendency to complain about little things. He refused to take his bath because he said he was not allowed to remain long enough in the tub, but when taken by force to the bath-room he laughingly gave in and took his bath as usual. When accused of breaking certain rules he admitted it and said he was willing to take any consequences of

his act. He promised not to break these rules again; was again reported, and this time he lied about the matter. Has taken a dislike to the ward physician and the head attendant in his ward, apparently because they have insisted upon his obeying the rules.

He has never at any time shown delusions nor hallucinations. When asked whether he would go the city to have another skia-graph of his head taken, he refused his consent, saying he would not do so until declared sane by the officials of the hospital. He has given the impression that he expects to be declared sane, serve a few years in prison and then be released. He still insists that there is no bullet in his head. All arguments presented to convince him of the error in his attitude toward his crime are met with polite but skillfully evasive answers. It seems impossible to find vulnerable points in his position, yet he at times gives the impression of one trying to maintain a false position and constantly on the alert to prevent anything being said or done to make that position untenable.

There are several features connected with this case which make it of more than ordinary interest.

First. I have seen no cases of traumatic amnesia reported in which the memory blank was filled in with a fabricated series of events. It is true, as pointed out by Meyer¹ and others, that cases of traumatic insanity are prone to fill in the amnesic periods, when present, with fabrications. However, in such cases the amnesia is usually the least important element in the case and the fabrication tends to disappear if consciousness becomes clear. In traumatic amnesia the lapse in memory is generally complete, clear-cut and usually permanent if induced by obvious organic lesion.

Whether there are enough facts presented in this case upon which to base a diagnosis of traumatic insanity seems most questionable. The man has at times exhibited temperamental tendencies which might perhaps be ascribed to the traumatic element in the case. On the other hand such characteristics might easily have existed previous to the shooting. I allude to his unreasonableness about small matters, history of moderate irritability and a certain attitude of suspicion which is present at times.

¹ A. Meyer. "The Anatomical Facts and Clinical Varieties of Traumatic Insanity," *AM. JR. INSANITY*, Vol. 60.

The chief interest of the case, however, rests in its medico-legal aspects. I have failed to find in medical or medico-legal literature any recorded case where the defense of traumatic amnesia has been employed successfully to convince a jury that a murderer was incompetent to conduct his defense and was, therefore, of unsound mind. The establishing of such a precedent would seem to be a very dangerous one, and, if followed by the courts generally, is likely to lead to many miscarriages of justice in the future. The legal definition of insanity as given in the statute quoted in this case is shown to be defective, since it permits traumatic amnesia for the crime committed to absolve the murderer from punishment for his deed.

The possibility of malingering is constantly to be borne in mind in such a case though, as in most cases, it is extremely difficult to detect its presence. The word-association test, as employed by Jung, Münsterberg and others for the detection of crime, is said to have been tried in this case, but with absolutely no success. It is stated that the answers given were entirely at random and no logical associations nor complexes of any sort could be detected.

[NOTE.—At this date, December 19, 1908, there is no appreciable change in the patients condition.]

IMBECILE, CRIMINAL, OR BOTH? *

By CHARLES W. HITCHCOCK, A. M., M. D., DETROIT, MICH.

The shameless exhibition of insanity successfully pushed as a defense of the crime of murder, followed by the indignant efforts of the accused to be adjudged sane so soon as his insanity plea had served its purpose, may well make the alienist at least cautiously critical of such a line of defense. That there are points, however, where penology and psychiatry are tangent, can hardly be gainsaid. Our social organization is still defective and certain classes are not yet clearly recognized, and so, of course, not provided for. But, it seems to me, our duty lies in the direction of considering these cases from the standpoint of our defective social scheme. It were indeed convenient if the "demi-fous" and "demi-responsables" could be assigned to their proper institutions, when recognized. Whether the habitual criminal be such a one may be another story.

The writer was called by his anxious sisters, who wished him declared insane because facing a criminal charge, to examine one, S. C., æt. 22, who never had any occupation, save, as the police say, he has always been a "cheap thief." He is an inveterate smoker of cigarettes; he is about 5 feet 6 inches in height and weighs about 145 pounds, thin-lipped and of shifty looks. His sisters say that his mother was a (left) hemiplegic (and hysterical) for five years before his birth. His family history is otherwise negative. He was an ordinarily healthy baby, and later attended the public school, to the third grade, when he ran away. That his police record began at tender years is evidenced by the following, showing no less than 41 arrests between the ages of 5 and 22 for charges from simple larceny to robbery:

* Read at the sixty-fourth annual meeting of the American Medico-Psychological Association, Cincinnati, May 12, 1908.

POLICE RECORD OF S. C.

Jan. 10, 1901	.... Simple larceny	Released to appear.
May 15, 1902	.... " "	Discharged.
" 20, "	.... Drunk	S. S.
June 2, "	.... Simple larceny	Complainant refused to prosecute.
" 11, "	.... Drunk	\$5 or 30 days.
" 18, "	.... Simple larceny	\$10 or 30 days.
July 7, "	.... " "	Complainant refused to prosecute.
Oct. 2, "	.... Suspicion	Discharged.
Nov. 1, " " "	"
" 4, " " "	"
" 14, "	.... Suspicion of breaking and entering a dwelling-house.	Complainant refused to prosecute.
Feb. 13, 1903	.... Simple larceny	\$15 or 30 days.
Mar. 18, "	.... Disorderly person	\$15 or 6 months.
Apr. 3, "	.... Drunk	Discharged.
July 16, "	.... Suspicion	"
Nov. 14, "	.... Vagrancy	\$5 or 30 days.
June 9, 1904	.... Suspicion of larceny	Discharged.
" 27, "	.... Disorderly conduct	\$3 or 6 months.
July 12, "	.... Drunk	\$10 or 30 days.
" 21, "	.... Resisting an officer	Discharged.
Nov. 1, "	.... Disturbing the peace	\$15 or 6 months.
Jan. 6, 1905	.... Suspicion	Discharged.
" 22, "	.... Simple larceny	\$50 or 90 days.
Apr. 8, "	.... Suspicion	Discharged.
July 26, " " "	"
Aug. 11, "	.... Drunk	\$5 or 30 days.
" 19, "	.... Suspicion of larceny	Discharged.
" 23, " " " "	"
Sept. 13, "	.... Suspicion	"
Nov. 3, " " "	"
" 4, "	.... Drunk	"
" 21, "	.... Suspicion	"
Dec. 6, " " "	"
" 13, "	.... Simple larceny	\$25 or 90 days.
" 28, "	.... Suspicion	Discharged.
" 29, " " "	"
Jan. 12, 1906	.... Robbery	1 year Jackson Prison.
May 10, 1907	.... Drunk	Discharged.
June 12, "	.... Suspicion of larceny	90 Days in House of Cor.
July 4, "	.... Larceny	
Oct. 17, "	.... Larceny from person	

It is to be noted that at the mature age of 5 years he was charged with simple larceny, and when he had attained the dignity of 6 years he was convicted of being drunk and sentenced therefor. During the second year of his criminal career he was arrested no less than 10 times; the next two years, 5 times each; the following year, 15 times; in 1906, once; and in 1907, 4 times.

When convicted and serving sentences in prison he has been an orderly, well-behaved prisoner, attracting no especial attention. In jail awaiting trial and without any work to do, he has been inclined to domineer over younger prisoners, impose on new comers, and ready to pick quarrels with those of inferior strength. He was several times examined in jail. He has a light, shifty eye, never looks you full in the face, and has a look and air of utter indifference.

His latest offense is the larceny (of a watch) from the person, and he steadfastly denies any knowledge of stealing it; says he doesn't know whether he took it or not. He maintains that he has no reason for his theft, that his sister has supported him, and that he has been perfectly willing that she should. He admits his frequent thefts, but denies that there is any reason therefor. His head is not ill-shapen, though his palate is a trifle high—arched and rather narrow. Physical examination of negative interest. His pupils were equal, normal, quickly responsive. His knee-jerks were plus. His hands are not moist. He seems quite indifferent to his crimes and to his surroundings; says he has had thoughts of reform, but that they seem weakly, poorly-formed thoughts. Asked if he would not, if discharged, continue the same criminal acts, he replies that he does not know. He denies being in any way ill; says he feels perfectly well. Now under sentence of five years to a prison for confirmed criminals, he says he doesn't want to go there "because they lick you there." He has no ambition whatever to learn any trade or follow any useful occupation, although there seems no mental or physical reason why he should not. He once obtained a position as a messenger, but lost it, because, he says, he put his hand in a man's pocket. He says he can resist the temptation to steal; that he doesn't have to steal. He seems to have no objection to terms in jail or prison; says, "It's all right."

He has, from early boyhood, given himself up to the gratification of every passing impulse; has lied, stolen, been drunk, made assaults, has had gonorrhœa and syphilis, and as soon as released after serving a sentence, seeks his old associates and gets again into trouble. Every time that he is seen he has the same slouchy look and shifty eye.

His sisters, who are anxious to have him declared insane as a possible solution of their troubles with him, aver that he at times rocks violently back and forth at home, attempting to sing, though he is not musical; that he once got up at night and went about the house thinking that people were after him and that, the last time he was at home, he went about the house with his shirt outside his trousers; that he whistles and talks to himself; that some of his thefts have been without any apparent object and so open as to suggest mental defect. On one occasion he is said to have arrayed himself in his brother-in-law's clothes and to have "prinked" before a glass. It is also said that he is a masturbator. He once stole a bundle of newspapers and went out on the street crying, "All about the mayor's suicide," in order to sell them.

These are the things that are alleged as evidence of mental impairment. It does seem to be the fact that some of his thefts have been clumsy and rather open, thefts by which he could profit little or none at all. He associates with thieves and seems to have a fondness for almost any kind of a theft.

The deputies on watch in the jail have been able to discover nothing in his conduct which seems to them to savor of the abnormal. He is vile in his language and overbearing to younger prisoners. He says he uses all the cocain he can get, snuffs it into his nose, likes the after-sensation. He does not care for reading, but writes his name and that of his sister in a plain hand. Sensation seems normal; no anæsthesia nor analgesia. The mental reflex seems not abnormally slow. He can understand when he wishes and can respond quickly enough when it suits him. Memory is not deficient.

In short, here is a man who from earliest years has given himself up to the indulgence of every passing impulse. His early associations were bad and have been continued. His impulses,

from association, are largely criminal and have been consistently followed. There hardly seems to the writer here sufficient evidence of mental impairment to brand him as insane. That he is morally defective is readily granted, but the defect seems to be the legitimate outcome of persistently indulged immoral impulses. It should hardly entitle him to be classed in the great army of the defectives, who have rightful claim to some public sympathy and provision.

Yet one of those who saw him pronounced him a high-grade imbecile; and on the strength of this opinion, although Michigan asylums are not supposed to receive idiots or imbeciles, he was committed to the Asylum for Insane Criminals, whence after a short sojourn he will probably be discharged to do it all over again.

Confined in a penal institution, he is a quiet, orderly prisoner, doing his work reasonably, making himself of service, while society is protected from his criminal instincts; and with this disposition of the case no sense of fitness seems violated, while he does seem an unfit companion for those who are the unfortunate subjects of undoubted psychoses.

Perhaps, the child of a hemiplegic mother, his heredity is a lessened moral resistance. Muensterberg has well said: "Criminals are recruited especially from the mentally inferior; that is the only true core of the doctrine of the born criminal. But the mental inferiority, intellectual or emotional or volitional, forces no one to steal and burglarize. He cannot and never will equal the clever, well-balanced, energetic fellow; but society may find a modest place, humble but safe, for even the most stupid and most indifferent and most unenergetic; no one is predestined by his brain to the penitentiary." It does not seem to me that the social equation here was devoid of powers of inhibition, nor that we are forced into a diagnosis of imbecility as its only solution. If this be one of the unfortunate class demanding treatment apart from the common criminal, it would seem that the rightful place for this class will not be found until our social scheme provides institutions to which the demi-insane and demi-responsible (of Gasset), *i. e.*, those of lessened responsibility, may be sent. The habitual criminal, however, is evolved, undoubtedly, from the creatures who fail to resist the downward impulses, which more or

less beset all. With each new giving away, the criminal impulses are stronger until eventually they are, as here, the ruling passion and their subject becomes the habitual criminal. To be sure, it may be argued that the habitual criminal is a phenomenon not found in the ranks of the normal, and that moral sense is so obviously defective as to entitle the habitual criminal to a certain amount of sympathy because of his lack of responsibility. Where, however, as in the majority of cases, the moral defect seems to be an acquirement of almost deliberate choice, where the will has been simply to follow the direction of impulse, it may be well to guard ourselves lest we fall easily into a mawkish sentimentality which makes a poor unfortunate out of the individual who, although he may have started with bad environment and a poor heredity, has been content, as in the case cited, to drift with the tide and resist no downward impulse.

This man seems to the writer to belong to the criminal class and not to be entitled to that preferment which he receives when classed as an imbecile. But the question may perhaps fairly be asked: Is he imbecile, criminal, or both?

P. S.—Under date of July 22, 1908, the superintendent of the State Asylum wrote that he did not, after careful observation, consider this case as a high-grade imbecile, but rather as a "psychopathic personality." His observation showed the man "intensely selfish, cunning, deceitful, egotistical, cowardly." He had "organized an attempt at escape that came near being successful, and included hardened criminals serving long sentences. The frustration of their plans affected him the least of any engaged in it." Observation led to the conclusion that he was improperly confined in an asylum and that he belonged in prison. In September, 1908, he was discharged as "cured" and returned to the authorities of Wayne County. Here in jail he talked in abusive terms of the asylum, and on trial for larceny was discharged (October 15).

Some other misdemeanor will doubtless again soon bring him before the courts, when he should, for his own good and that of the community, be committed to prison for a maximum time.

December, 1908, sees him again under arrest.

ALCOHOLIC PSYCHOSES IN HOSPITALS FOR THE INSANE.*

By JAMES M. KENISTON, M.D., MIDDLETOWN, CONN.

With the recent and increasing tendency to extend the frontiers of insanity, very many cases are now committed to hospitals for the insane, which formerly would have never, or seldom, been sent there. Take for example, infection and exhaustion psychoses, simple senile deterioration, imbecility, etc. Thus our hospitals are overcrowded.

Hence an important question which confronts us is: Should all cases of alcoholism be treated in hospitals for the insane? This question has not been finally settled. There is no doubt that many alcoholics develop a psychosis of some kind. Delirium tremens at once occurs to us and is now considered by all but a few physicians as a *mental* disorder, presenting deep clouding of consciousness, numerous and terrifying hallucinations and delusions, great fear, inability to control attention, great psychomotor unrest, besides the tremors, insomnia, anorexia and other physical symptoms. The course is rapid and the prognosis fairly good, at least for first attacks, with prompt and proper treatment. Cases of delirium tremens are being committed to this hospital¹ to a large extent during the past ten years, viz., seventy-five cases, six of whom were females. Cases are also being sent more and more freely to general hospitals, whereas twenty or more years ago they would have been treated at home, in police stations, jails, or, where such existed, in inebriate asylums.

Owing to the extreme fear, restlessness, defensive and protective movements—attempts to escape from the threatening "horrors"—which often lead to assaults on the nurses and physicians, and the almost continuous outcries by night as well as by day, these patients are a very disturbing element, and unless

* Read at the sixty-fourth annual meeting of the American Medico-Psychological Association, Cincinnati, May 12, 1908.

¹ Connecticut Hospital for Insane. Dr. Henry S. Noble, superintendent, has kindly given permission to use statistics.

proper means of isolation are available will upset the order of an entire ward.

In alcoholic delusional insanity and alcoholic paranoia, we find patients as a rule comparatively free from motor unrest, although brief exacerbations of excitement may occur. In these psychoses the *fundamental* symptoms are the delusions of persecution, infidelity or hostility, with hallucinations, almost invariably aural, while consciousness is clear, the train of thought is fairly relevant, the emotional affect is not in proportion to the delusional formation, and patients can and often will co-operate in treatment, as they have *some* insight as to the *cause* of their trouble.

During the past ten years there have been admitted to this hospital 170 cases of alcoholic delusional insanity, 19 of whom were women. During the same period there were admitted 167 cases of chronic alcoholism, 35 of whom were women. This psychosis, which practically forms the basis on which arise most, if not all, of the other alcoholic psychoses, is characterized by a gradually progressive deterioration, shown chiefly in impaired memory, lack of concentration, incapacity for production, faulty judgment, moral degeneration and blunted emotions. The ultimate dementia in cases which do not recover never reaches the extent and intensity of that characteristic of dementia præcox.

We have had a few cases of alcoholic paresis and Korssakow's psychosis. My object is not, however, to give the complete symptomatology and course of the alcoholic psychoses, but simply to call attention to their *fundamental* symptoms.

Alcoholic psychoses, classified as such, have only within a very few years been reported in the tables of our American hospitals; in fact, some hospitals do not now report them. They have been tabulated under the head of *toxic* insanity, or packed in with the cases of acute and chronic mania or melancholia, according to the predominance of certain psychomotor symptoms and emotional states. To-day, anyone with a fairly long experience, recognizes the fact that the psychoses induced by alcohol present a fairly typical clinical picture, taking into consideration not only the etiology and symptomatology, but the *course*, prognosis and treatment. Alcoholic abuse is associated with *other* causative factors in psychoses other than alcoholic, but for the purposes of this brief paper all such are excluded.

We will now proceed to a statistical study of the number of alcoholic psychoses admitted to the Connecticut Hospital for the Insane since the adoption of the Kraepelin classification, October 1, 1898. Dr. A. R. Diefendorf, in a study of 2000 consecutive cases, found that 238 cases, or 11.90 per cent, were alcoholics.

TABLE I.

	Male.	Female.	Total.
Acute alcoholism	2	0	2
Alcoholic delusional insanity ¹	97	12	109
Chronic alcoholism	46	12	58
Delirium tremens	45	9	54
Alcoholic paranoia	10	3	13
Alcoholic paresis	2	0	2
	202	36	238

From October 1, 1898, to September 30, 1907, there were admitted to this hospital 3893 cases, all of which were thoroughly examined, presented before our regular daily staff meetings, and criticized by the entire medical staff. All were carefully reviewed, and no case was tabulated until the diagnosis had been confirmed. The next tables gives the admissions of the alcoholic psychoses for the last nine years.

TABLE II.

	Total admissions.	Total alcoholics.	Per cent of alcoholics to admissions.
1898-9	425	40	9.41+
1899-0	450	52	11.55+
1900-1	424	47	11.08+
1901-2	437	39	8.92+
1902-3	425	56	13.17+
1903-4	459	48	10.45+
1904-5	466	48	10.30
1905-6	413	53	12.59
1906-7	394	57	14.46
	3893	440	11.30+

The percentage of total cases of "toxic insanity" admitted prior to October 1, 1898 (which included a few cases of morphinism),

¹ Kraepelin now substitutes two forms—acute alcoholic hallucinosis and alcoholic hallucinatory dementia—for this group.

to the total admissions for the same period, viz., 247 cases out of 8446, was 2.92+. While with the more modern resources in the way of examination, and the greater care now taken to procure a full and detailed history of cases, the percentage of alcoholic psychoses would perhaps have been greater prior to 1898, the writer is convinced that during the past decade there has been an actual, and not merely a relative, increase in the number of alcoholics committed to this hospital. This is shown by the following table in the order of classification:

TABLE III.

	1899	1900	1901	1902	1903	1904	1905	1906	1907
Chronic alcoholism	24	17	15	15	16	18	20	16	26
Delirium tremens	10	14	11	3	13	4	8	6	6
Alcoholic delusional insanity...	3	16	18	19	26	25	17	26	20
Alcoholic paranoia	3	5	2	2	1	1	3	4	3
Alcoholic paresis	0	0	1	0	0	0	0	1	1
	—	—	—	—	—	—	—	—	—
	40	52	47	39	56	48	48	53	56=439

I have been unable to study the statistics of American hospitals fully, but have derived some data from a few hospitals in New England. At Danvers, Mass., the total alcoholics admitted in 1903 was 54, and total admissions were 432; in 1904, 100 cases to 754 admissions; and in 1905, 73 cases to 514 admissions. This gives the yearly percentage of alcoholics to total admissions as 12.50 per cent in 1903; 13.26 per cent in 1904; and 14.20 per cent in 1905. Average for three years was 13.35+. At Bridgewater the per cent was 17.89+ for 1903 and 36.55 for 1904. These patients were all from the criminal class, which accounts for the excessively large ratio.

In Vermont, heretofore a prohibition State, we found the per cent to be 8.44, while in 1906 it was only 2.40+. At Westboro in two years (1905-6) there were 96 alcoholics in 874 total admissions—a percentage of 10.98+.

At Medfield the percentage of alcoholic psychoses to total admissions for four years (1902-6) was respectively 8.17+, 9.20+, 12.66 and 13.38+. Average for four years was 10.73+. The average at the Taunton Hospital for three years (1903-6) was 10.80 per cent.

Omitting Vermont and Bridgewater, we find pretty uniform ratios in the others investigated, as shown in Table IV.

TABLE IV.

Danvers	13.35+
Westboro	10.98+
Medfield	10.73+
Taunton	10.80
Middletown	11.30+
Diefendorf (2000 cases).....	11.90

In Italy, out of 1814 patients admitted to the Naples Asylum in 1901-5, 314 were definitely ascertained to be alcoholics—a percentage of 17.30+. Bianchi^{*} thinks there is perhaps an unconscious effort to make up for deficiency of food by taking alcoholic beverages, or to counteract the mental depression that is produced by the existing intellectual, physical, and social conditions. It is probable that in southern Italy much, not only of the epilepsy, crime, and idiocy that occur in that region, but also of the corpulence, indolence, indifference, rarity of noble impulse, excitability, irascibility, and impulsiveness displayed by the population may be due to the excessive use of wine. He expects better remedial results from education than from legislation, and maintains that the doctor must take the leading part.

In France the large percentage of cases of alcoholism has aroused not only the medical men, but the state. The U. S. consular report quotes the results of a careful and systematic investigation made by Mr. Mirman, director of the Department of Public Assistance and Hygiene, to determine the exact relation in France of alcoholic excess to mental alienation. His report divides the patients in the various public asylums into three groupes: viz., (1) those affected by simple alcoholism; (2) cases of alcoholism complicated more or less with degeneracy or mental debility, and (3) all cases of mania, intermittent insanity, systematic delirium, etc., in which the abuse of alcoholic drinks has been a definite contributing cause.

Group one includes 2287 men and 721 women, a total of 3008. Group two comprises 2237 men and 1048 women, a total of 3285. Group three included 2538 men and 1101 women, a total of 3639. The grand total was 9932. At the same time the whole number of the insane from all causes in French asylums was 71,547. Hence the percentage of alcoholics of all kinds was 13.60.

^{*} Review Neurology and Psychiatry, February, 1907.

This report also shows the important rôle in the drama of degradation played by absinthe, which has been fitly called "the curse of the youth of France." Four thousand, eight hundred and eighty-two, or nearly one-half of the above 9932 cases, owe their degradation to absinthe or the two or three other so-called "aperitifs" which in France form the customary tippie at cafes and drinking bars. The *serious* element in Mirman's statistics is the revelation of an *increase* during the decade from 1897 to 1907 of 57 per cent in the number of insane in thirty-six departments of France. The national league against the abuse of alcohol is now organized and actively pursuing a crusade against intemperance and the sale of absinthe and other noxious liquors.

While statistics are not available to the writer, it is my impression that the increase of alcoholic psychoses has been noted in many other countries; notably in Russia, England and Germany. In fact, alcohol has become not merely a local or state peril, but a national and even a world plague, the more dangerous because the results of its continued ingestion are often so insidiously manifested. The nations are beginning to notice and act.

In the report of the Connecticut Hospital for Insane for 1906 the trustees say:

Alcoholic patients are committed by the courts, many of them for definite terms. Many of them, after a short period in the hospital, are not insane in the true sense of the word, even if a very liberal interpretation of the term had declared them to be so at the time of the commitment. Still they must be retained until their sentence expires. What disposition to make of these unfortunate people is a very serious question affecting many families and homes.

Not only are hospitals beginning to ask if some special institutions should not be established wherein a large proportion of alcoholics should be treated, and not be required to mingle with the ordinary insane; not only are town and national governments discussing the problem of alcoholism in all its phases—medical, social, economic and therapeutic—but we find the business world also not only studying the question, but taking stringent action to protect its interests from the injuries inflicted on it by alcohol. For a dozen years or more every big railroad system in the country (U. S.) has enforced a rule against drinking by their employees, especially those in the operating departments. More

than one million men are included in this rule. On most of the roads the employe found entering or coming from a saloon while on duty is immediately discharged, unless he can prove that he did not visit the place to take a drink or to loaf. The United States Department of Labor found that 72 per cent of agriculturists, 79 per cent of tradesmen and 90 per cent of railroad officials discriminate against men who drink. So far as I can learn, no hospital, either general or special, in the civilized world, will knowingly keep in its employ any nurse who is known to drink. It seems ironical, but it is true, that no "respectable" saloon will employ a bartender who drinks.

In Great Britain, during the past seven years, there has been a reduction of nearly 14 per cent in the consumption of beer and of over 22 per cent in the consumption of distilled spirits. Sir Victor Horsley states that there has been a marked decrease in the use of alcohol in English hospitals since 1872, and in more recent years in its use in the special treatment of fevers, and his data seem to indicate, so far as they go, a changing medical view of the medicinal value of this agent.*

"In many of the great public hospitals of Berlin not a drop of alcohol ever enters the doors, efficient substitutes having been found."* The last German National Socialist Convention voted almost unanimously against the use of alcohol during working hours, and inveighed against the pernicious custom of drinking four or five quarts of beer while at work—a procedure long regarded as sacred by many German laboring men.* There is only room for an allusion to the great temperance movement, which starting in South Carolina and sweeping through the entire South, is now reaching out over the entire country. At this date over one-third of the entire population live in communities where the law forbids the sale of alcoholic beverages. In Connecticut a drastic law was enacted by the last legislature, decreasing the number of saloons. While no one (except fanatics) believes that prohibition laws will abolish all drinking, it is evident that the question of how to abate the evils of alcoholism is a vital one—a

* Report British Association for Advancement of Science.

* New York *Herald*.

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* New York *Herald*.

* Ibid.

condition and not a theory—and an educational process is going on which will bring forth some good.

The probation laws in force in many States are helps. In Chicago recently Judge Cleland severely reprimanded a physician because he prescribed brandy for a parole man, and threatened him with a jail sentence if he ever did it again. "This man loses control over himself when in liquor, and as a result of this dose went on a prolonged debauch—the first in many months. . . . It's men like you that overturn the work of a good many friends of a man. You ought to find out all about a man before you advise him to take liquor. This applies to all other physicians as well."⁷

We have shown that to-day there is a very large number of cases of the alcoholic psychoses committed to our hospitals for the insane. As many of these cases tend to become, or are already chronic, the percentage of those present in any year will naturally increase. We have also shown in part that similar conditions prevail in other countries.

It seems to me that if alcoholics are to continue to be committed to these hospitals, there should be some legislative provision whereby every alcoholic, so far as his physical condition will allow, should be *made to work*, not only because occupation is now recognized as one of our most valuable therapeutic resources, but also for the economic gain. Most of this class will not work unless obliged. Further, courts should give long sentences. In my opinion, one year should be the minimum. In cases where patients are committed several times, disfranchisement might act as a deterrent. It would also be well to punish by imprisonment and fine any person selling or giving liquor to any alcoholic who had been an inmate of a hospital for the insane.

On the whole, I am more and more inclined to the opinion that the interests of the individual, the town and the State would be best subserved by creating in each State institutions devoted exclusively to the care of all alcoholic habitues, sane or insane. As this course is now generally recognized as proper for epileptics, most of whom display some mental deterioration, why not for alcoholics?

⁷ Chicago paper.

NEUROPATHIC WARDS IN GENERAL HOSPITALS.*

By CAMPBELL MEYERS, M. D., TORONTO, CANADA.

Mr. President: As functional nervous diseases have of late occupied a prominent place in the advance of medicine, I thought a few remarks on the practical result of their treatment for the past two years in the special department of a general hospital, might be of interest to this Association.

I may first say that I advocated the formation of neuropathic wards in general hospitals primarily, in the belief that a practical means would thus be found for the prevention of the most serious disease which, not only the physician but the State has to contend with, viz., insanity.

I would here state that by the word "insanity," as used in this paper, I would refer only to the *acute* insanities, the psychoneuroses of Kafft-Ebing; and by functional nervous disease; to those forms especially of so called neurasthenia, in which psychological symptoms predominate, or as it might be termed, acute psychasthenia. The chronic insanities, such as dementia præcox, etc., are not included.

With the many other beneficial results, which arise from the treatment of those functional nervous diseases, in a special department of a general hospital, which do not tend immediately towards insanity in their onward course, I will not detain you.

I would like first to direct your attention to the question of the prophylaxis of insanity from a neurological point of view, viz., by beginning at the earliest stage of the development of nervous disease, and proceeding thence to the more advanced stage, when the boundary-line of insanity is reached.

The question of the prevention of insanity has been discussed chiefly by the alienist, who, in spite of every effort to promote this good work, has been greatly handicapped by the existing condition of affairs, since the patient only comes under his care when

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actually insane, and in consequence, the patient's state previous to admission must remain more or less a surmise to him. The average general practitioner, under whose care these cases must inevitably first come, has heretofore received an instruction in insanity, and these functional nervous diseases, which has been wholly inadequate in proportion to their importance, and which, when added to the isolated treatment of the insane apart from general hospitals, has unfortunately led to the development of a chasm of considerable dimensions between alienation and general medicine. This chasm will, I trust, be bridged by the neurologist. The study of neurology heretofore has been largely confined to the organic nervous diseases, and the contributions to the elucidation of the problems of this class of disease in recent years by the neurologist has been most gratifying. The functional field, however, with its gates wide open, has admitted but comparatively few workers, and in consequence this fertile field has remained, for the most part, uncultivated.

A preliminary difficulty with which we are confronted in the consideration of these troubles, is their classification, since the nosology of both functional nervous diseases and insanity has been much changed in the past few years.

A discussion as to a line of demarcation between functional nervous disease and insanity is so broad a question as to be entirely beyond the scope of a short paper, and yet some more or less clear conception of what is intended to limit the former is essential. If we attempt to draw a line *pathologically*, it must, in the present state of our knowledge, end in confusion. While all admit that both these forms of disease are due to a lesion in the nervous system, and in many cases a purely functional lesion, yet, to describe an attack of mania as a functional nervous disease, while *pathologically* correct, would certainly lead to much misunderstanding. Hence, much as it is to be desired, that these diseases might be classified on the basis of their pathological anatomy, and further, that the term "functional" as applied to nervous disease should become more restricted, such is at present impossible. We must, therefore, turn to-day to another basis of classification, which, while it presents many imperfections, is for the present the more practical one, viz., the *clinical* basis.

On this basis, the boundary-line forms the line of demarcation between functional nervous disease and insanity. While it is sincerely hoped that this boundary-line will in the future be eliminated, except for medico-legal purposes, and, as I advocated in an earlier paper, that it will no longer form a barrier in the treatment of these diseases as at present, still, for another generation at least, it must exist and will meanwhile serve a useful end. If we regard the boundary-line of insanity as indicating a more or less advanced stage of functional nervous disease, we will, I think, have a practical basis on which to proceed.

I would now desire to direct your attention to a modest beginning which has been made in the Toronto General Hospital, where neuropathic wards were established now nearly two years ago. A building which was semi-detached from the hospital, and had been formerly the residence of the medical superintendent, was kindly offered by the trustees of the hospital, and the Ontario government made a grant sufficient to cover the alterations necessary. By this means, accommodation for twelve beds was provided—six for male and six for female patients. Two floors were thus occupied, and the beds so arranged that four on each floor were in a large ward, while the remaining four (two on each floor) were in separate wards, and were thus utilized for isolation. At first wire screens were placed on the outside of the windows, but later these were found unnecessary and an objection in regard to fire escapes, and they were discarded, the windows being fastened by a simple lock in doubtful cases. On each floor a room was fitted up with hydro-therapeutic apparatus, and these, with a diet kitchen on each floor consumed all the available space in the main part of the building. I may add that the upper story was used as a dormitory for the nurses, and that in the basement a strong room was made for the *temporary* detention of a violent or dangerous patient, until he could be transferred to an asylum, which was done as speedily as possible. On the exterior of the building, two large open balconies were made on the south and east sides, thus allowing provision for plenty of fresh air and sunshine to the patients, who utilize them both in winter and summer with excellent results. While the general conformation of the building and its limited accommodation presented several defects which

could not be overcome; still the broadmindedness of the trustees in offering the building and in establishing a separate department in the hospital, more than compensated for these defects, and I very willingly assumed charge of it at their request.

While the object of these wards was the *treatment* of acute nervous disease, it was soon found that a certain proportion of cases admitted did not belong to this category, and consequently they could only be admitted for observation. After being under observation for a sufficient length of time, to determine the diagnosis, they were, if found insane, at once transferred to an asylum or taken away by friends. These cases were not visibly insane when admitted, but had been referred to these wards simply as "nervous." They comprised such cases as dementia præcox, often in an early stage, and a decision as to their diagnosis, with advice as to the steps to be taken in their treatment, probably averted a crime in at least two of the cases admitted at this early stage. Had these wards for the "nervous" not existed, it is altogether probable that a study of the symptoms would have been delayed until the commission of a crime betrayed insanity. The report of these wards for the past two years shows that 20 per cent of the cases were, after observation, adjudged to be suffering from some form of insanity on admission, and thus not suitable for treatment.

As mentioned above, I will not detain you with a discussion in regard to the other functional nervous diseases admitted to these wards for treatment, such as hysteria, epilepsy, functional paralyses, etc., which did not exhibit any immediate tendency to the development of insanity. On turning, however, to those cases for which these wards were especially established, we find that 67 cases have been admitted to date suffering from acute psychasthenia. There is not included in this number those cases of neurasthenia in which *somatic* symptoms predominate, in which their disease might be termed "somatasthenia." I would, however, here mention the immense field which is open for study in the functional nervous disturbances of the thoracic and abdominal viscera, a field of study in which not medicine alone, but surgery as well, might claim its quota of the benefits.

I will not here enumerate the psychical symptoms of neurasthenia with which you are all so familiar, but I would like par-

ticularly to lay stress upon one fact, viz., that the progressive intensification of these same symptoms leads the patient to a more advanced stage of this same affection, which we then term insanity.

May I now mention a synopsis of the history of a patient who was under treatment last year, and whose symptoms fairly well represent the type of case admitted as acute psychasthenia?

She applied for admission about May 1, but as there was no vacancy, she was obliged to wait. As she was very urgently in need of treatment, I feared she might become insane before a vacancy occurred. She came several times to the hospital while awaiting admission, and on each visit her symptoms were more pronounced, and my anxiety about her mental condition greater. When the vacancy finally occurred on May 18, she was very near to the boundary-line of insanity. The history is as follows:

M. M., female, age 46, admitted May 18, 1907. Discharged August 24, 1907.

Family History.—Father living and well, 87 years of age; not nervous; a farmer, and has always enjoyed the best of health. Mother dead; paralysis; 68 years. Was of a very nervous disposition, as were also five sisters; otherwise negative.

Personal History.—Occupation, housekeeping; no children; no miscarriages. Began to menstruate at about fourteen; always regular, and never suffered very much pain at her periods. As a child, says she was not of a nervous disposition. Never had chorea or other nervous trouble. Says she was quite bright at school, but never applied herself closely to her studies. Always took a great deal of outdoor exercise. Is a farmer's wife. Married at 26. Says she has never worked hard; always has had a comparatively easy time.

Previous Illness.—Had influenza a number of times; otherwise quite healthy till present trouble developed.

Present Illness.—Patient says it began about one year ago, and she attributes it wholly to the fact that her husband was taken seriously ill with paralysis, and patient worried very much, thinking that he would not get better, as he was confined to his bed for about six months. Patient says she became exhausted by worrying and by the work in attending to her husband. The first symptom to make its appearance was weariness. Patient says she felt tired each morning on arising, and even though she rested during the day she still felt tired. Then insomnia developed. She began to worry about any small matter, and felt that she was surrounded by a multitude of troubles which she was unable to overcome. She frequently became depressed, and finally gave up all hopes of getting better.

Patient became irritable, petulant and emotional—any small matter that called for mental exertion caused her temper to give way. She began to feel that she was not capable of performing the duties which she was called upon to perform. She says she misconstrued remarks made by others, and felt that she was being made fun of when she heard anyone laughing or talking. Complains of a feeling of constriction about the head. Complains that she is indifferent and lacks interest in anything she is doing; cannot concentrate her thoughts, and she is never surprised at anything, no matter how unexpected it may be. She takes everything as a matter of course—has become listless. Feels restless and has a desire to be on the move. Cannot content herself with being quiet, and feels the want of some outlet for her feelings. She has often felt that she is a burden to herself and her people, and that she would sooner be dead.

Physical Examination.—Negative.

The ward notes, after recording various ups and downs, read as follows on July 27:

Has slept very well during the last week, with exception of the last two nights. She is brighter and looks better than she did a week ago. Has gained $3\frac{3}{4}$ pounds this week.

August 2. Patient doing well. Gained $2\frac{1}{4}$ pounds this week.

August 8. Patient eats and sleeps well, and is very cheerful.

August 14. Patient cheerful and sleeping well. Gain in weight equals $2\frac{1}{2}$ pounds last week.

August 24. Patient sleeps well, eats well and is bright. Wants to go home to her husband. Discharged. "Recovered." Duration of treatment, 3 months and 6 days.

This patient was doing her household work and nursing her husband, who was still partially paralyzed, when last heard from two months after leaving hospital.

In regard to this history, I may say that while it is at all times difficult to express on paper the degree of intensity of any feelings, I think sufficient has been written to show that a progressive intensification of the symptoms occurred from the beginning, when there was simply undue weariness with loss of sleep and increased emotivity, up to the date of her admission, when her listlessness and depression became so marked that she gave up all hope of getting better, and felt she would sooner be dead. She was then evidently on the border-land, and any further intensification of her symptoms would have resulted, either in self-destruction or an attack of insanity.

Of the results of treatment in the 67 cases above mentioned, 22 were discharged recovered; 36 improved, and 9 were unimproved by treatment and became insane. Hence, in 85 per cent of these

cases admitted, the immediate danger of insanity was averted, a result which can, without difficulty, be reduplicated under similar circumstances in any general hospital when the cases come under treatment sufficiently early. No accident has occurred since the inception of these wards; there is no red tape in regard to admission; no difficulty in regard to detention, and finally, no stigma from being treated with the insane, which the laity so much dread. Again, and perhaps most important of all, clinical instruction has been given in these wards during the past winter. The house staff, the students and the nurses have all referred in warm terms to the value of their experience from the observation and study of these cases.

There now remains one other point to which I would like to direct your attention, and this is in regard to a suggestion which has been made to treat these cases in a psychiatric hospital. The attempt to do this would, I firmly believe, be a grievous mistake. Every alienist is well aware of the difficulty in getting the acute cases of insanity under treatment at an early date, owing to the prejudice of friends to have a near relative treated among the insane. How much greater then would be the prejudice when the patient was as yet suffering from nervous disease only! Practical experience has demonstrated in the wards of the Toronto general hospital that the presence for a short time only of a patient visibly insane has so disturbed the other patients in the same ward that the ill effects were felt for days, even after the removal of the patient from the building. Again, the influence of suggestion, induced by the presence of the insane in the same building, is most harmful, in view of the importance of psychic treatment of these cases, many of whom fear they will themselves become insane, and this fear would thus be kept constantly before them. If further practical results are desired, I may mention the last report of that most excellent department of the Albany Hospital, Pavilion F. The fifth report of this pavilion shows that only 2 per cent of the total cases admitted suffered from neurasthenia. Any attempt, therefore, to treat functional nervous disease in the same department of a hospital as the insane, will, I am assured, result practically in failure, and the nervous patients will return to the general medical wards of the hospital as of yore.

In conclusion, I may state that as a result of more than fifteen years of experience, devoted exclusively to the study (under exceptionally favorable conditions) of diseases of the nervous system, and of which these functional cases formed a large quota, I am convinced that for the true prophylaxis of acute insanity we must look to the general hospital, and that this result will be best accomplished here by the formation of neuropathic wards, especially equipped for the purpose.

Notes and Comment

PARESIS AS A MENACE TO PUBLIC SAFETY IN TRANSPORTATION.
—The *Boston Medical and Surgical Journal* for February 6, 1908, contains a very suggestive and timely paper by Dr. Phillip Coombs Knapp, entitled "General Paralysis as a Menace to Public Safety in Transportation" in which the author refers to several cases of paresis he has seen among railroad employes, as well as other forms of chronic nervous disease of a character which impaired the ability of the patient to discharge the responsible duties of his position.

Doctor Knapp advocates "thorough examination by competent neurologists at regular intervals" in order to detect the presence of nervous disorders interfering with the capacity of the individual and thus prevent the risks incident to keeping such persons in positions of responsibility.

From an editorial in the same *Journal* we learn that a committee was appointed by the Boston Society of Psychiatry and Neurology, consisting of Drs. Knapp, C. G. Dewey, and G. A. Waterman, to inquire into the matter. After investigation it was recommended that a committee be appointed to confer with the Railroad Commission of Massachusetts and the heads of transportation companies and take such action as might be thought necessary.

This is a move which might well be followed in other States and in which the members of the Medico-Psychological Association might take part as a civic duty.

In this connection attention is called to a series of articles which have appeared recently in the *Atlantic Monthly* under the title: "Confessions of a Railroad Signalman," in which there is much food for thought, especially for those who would wish to see greater safeguards than at present exist, thrown around both those who travel and those who are employed by transportation companies.

The final paper of this series refers to the relief department of the Baltimore & Ohio Railroad as follows: "The company, through a corps of medical examiners and surgeons, closely supervises the health of its employes and the sanitary conditions of the places where their work is performed. This corps is in charge of a chief surgeon and a chief medical examiner, both prominent in their profession, and, although the number of men in their charge exceeds forty thousand, any complicated or persistent disability of an employe secures the personal supervision of the chief surgeon."

Many other railroads have organized medical and surgical supervision and service, and it would seem to be a fairly simple matter to add to the medical staff of each road a competent neurologist who could formulate brief but sufficiently comprehensive forms for physical and mental examination to be used by the general medical examiners, who should be instructed to refer all doubtful cases to the neurologist for personal examination.

It is not alone among the employes of railroad companies that the risk of unsuspected mental or nervous disease of a character which renders the affected employe a menace to public safety, exists. Means should be instituted, indeed should be required by law, to minimize this risk as far as possible in all lines of public travel whether by land or water.

No one of any extended experience among the insane but has observed paresis and other serious mental affections among railroad and steamboat employes, and has known of instances in which persons so afflicted have continued in service for some time before the malady was suspected or detected.

If the attention of transportation officials and of railroad commissions is directed to the danger which exists, steps will no doubt be taken to meet the emergency, and any advice or assistance from those competent to give it will, we are certain, be welcome.

MARYLAND PSYCHIATRIC SOCIETY.—At a meeting held on the afternoon of November 6, 1908, at the Sheppard and Enoch Pratt Hospital, at Towson, Md., a society was formed under the above name. Its membership includes the officials of the state and other institutions devoted to the care of the insane and defective, and

others interested in the same work. Its purpose is to secure more frequent meetings of those interested in a common cause and to promote the discussion of measures for the advancement of the care of the insane. State care of the insane will probably be the leading topic of interest for some time, as a strong effort is being made to secure this at the next meeting of the state legislature, which occurs a year hence. A committee composed of Drs. Edward N. Brush, of the Sheppard and Enoch Pratt Hospital; J. Percy Wade, of the Maryland State Hospital, at Spring Grove; and J. Clement Clark, of the Maryland State Hospital, at Springfield, was appointed to confer with the Lunacy Commission relative to any matters regarding state care.

It is expected that the society will hold quarterly meetings at the different hospitals, where the senior medical officer will serve as chairman of the meeting. Dr. W. R. Dunton, Jr., was appointed secretary, to serve for one year.

ANNUAL MEETING OF FRENCH ALIENISTS.—The eighteenth annual meeting of *Médecins aliénistes et neurologistes de France et de pays de langue française* was held at Dijon under the presidency of M. Cullere, who made a very interesting address upon the psychoses, neuropathies, etc., shown by members of the Court of Louis XIV and recorded by their contemporaries, after which M. Laignel-Lavastine gave the psychiatric address upon Mental Disorders Due to Abnormalities of the Internal Secretory Glands. The neurological address was by M. Verger, on the Diagnosis and Clinical Forms of Neuralgia, and that on legal medicine, on the Care of Abnormal Children, was by M. Charron. Besides these addresses many papers were read. The next meeting will be held at Nantes, under the presidency of M. Vallon.

FOURTH BELGIAN CONGRESS OF NEUROLOGY AND PSYCHIATRY.—The opening session of the fourth Belgian Congress of Neurology and Psychiatry was held in the Hotel-de-Ville of Ghent, September 26-27, 1908, under the joint chairmanship of M. Sans, president of the *Société de Médecine Mentale*, and of M. Ley, president of the *Société de Neurologie*. The former made a brief address of thanks to the mayor, reception committee, etc., and especially

paid tribute to the memory of Guislain. He was followed by Doctor Ley who delivered an address upon the etiology and prophylaxis of mental alienation. M. Steinhaus then spoke upon the pathologic anatomy of tumors of the cord, and was followed by M. Fameune upon the influence of the disposition upon the pathogenesis of the neuroses.

In the afternoon a visit was made to the school of special instruction of Ghent, where the superintendent of public instruction, M. Deridder, in an address, expressed his sympathy with neurology and psychiatry in their relation to abnormal children. M. Dupureux then gave an abstract of his paper on the education and psychology of the defectives in Belgium, after which a visit was made to the Asylum of St. Joseph, where a drill and demonstration finished the day.

The next morning's session was held at the Hospice Guislain under the chairmanship of Doctor Deny, of Paris. M. Laruelle gave an abstract of his paper on hysteric psychoses, after which the asylum was visited. In the afternoon a visit was paid to the new asylum of Melle where a number of congratulatory addresses were made and the discussion on M. Laruelle's paper resumed. A report was then made by the committee appointed by the Antwerp congress to grant diplomas to nurses, and Mons was selected as the next meeting place. In the evening a dinner was held.

It would seem that the plan of having few papers and more time for discussion which has been followed by the Belgians in former years as well as in this, might be inaugurated in this country.

ERRATUM.—October, 1908, number, page 286, line 16, read stainable for chromatic.

Book Reviews.

Religion and Medicine—The Moral Control of Nervous Disorders. By ELWOOD WORCESTER, D. D., Ph. D., SAMUEL MCCOMB, M. D., D. D., and ISADOR H. CORIAT, M. D. (New York: Moffatt, Yard Co., 1908.)

Our final impression, on laying this book down, is that as a literary product it is hopelessly commonplace. As a contribution to science it has not the least importance, and it has not even the merit of being a well-executed digest. Whatever scientific matter it contains is merely the result of an uncritical and hasty compilation. The task of reading it has been wearisome to us in the extreme, for we have derived no new ideas from it whatever. We can, therefore, not recommend it to scientific readers, and shall attempt no detailed review of its 416 rather monotonous pages, but shall pass instead to a consideration of what we regard as the ruling motive of the book.

Dr. Worcester and his colleagues write with a motive. They are authors with one idea, and like all such authors they attempt to bend everything to their purpose. They represent a class of writers who have no concern with the advancement of science, but who attempt to seize upon the contributions of science, and of pseudo-science, for the advancement of some particular scheme of their own. Such writers always have been, and always will be, mischievous.

The motive of this book is to exploit a religious propaganda, and the evangelical method which the authors adopt, is not by preaching, but by the healing of disease. This resort to therapeutics has always been a weakness of propagandists, as the history of religion amply shows, and Dr. Worcester is merely following an old cult. If he is entitled to any credit for originality, it lies in the fact that he has become discouraged with the ordinary evangelical methods, and has rashly struck out for himself in the wide domain of modern scientific medicine.

That Dr. Worcester is deeply discouraged with the old evangelical methods of the churches is evident from his own confession. We refer to this aspect of his case because in order to understand the book it is necessary to understand the man. Dr. Worcester is evidently in a state of religious unrest. His first chapter is a confession of that fact. He is dissatisfied and in a mood of vague expectation of something going to happen. What it is that is going to happen he evidently does not know, but he already has his ear to the ground and is not going to be caught unawares by any new thing that may be on the way. He seems to dwell in an atmosphere of Eddyism, and he appeals despairingly to the wonders

accomplished by that new religion as something not only enviable, but quite beyond the powers of the orthodox churches as at present conducted. He quotes Renan to prove that even now we may be on the threshold of a new revelation, without suspecting it any more than Juvenal, Tacitus and Celsus suspected the true significance of the nascent Christianity which they mocked. So convinced is Dr. Worcester that some great mysterious change is coming on the world that he assures us gravely that mankind is now getting over the "materialism" of the nineteenth century, and that the new twentieth century is to be a blessed period of "mysticism and spirituality." All the time he is telling us these important facts he is evidently keeping one eye on Christian Science, as though he already half believed that the prophetess of the new revelation is to be Mrs. Mary Baker Eddy and the new Jerusalem is to be located not far from Boston Common.

From a man in this state of mind it is possible to expect anything but a clear appreciation of scientific medicine. This science, in fact, appeals to Dr. Worcester not for its own sake, not for its achievements, but simply as something that can be exploited to bolster up an evangelicalism which is confessedly in a bad way. His mental grasp of scientific questions is revealed by his crude dualism; for him even the memory is not to be explained as a modification of brain substance which can be transformed into thought; and for him also Eddyism provides "freedom from the fetters of sense," and "victory of the mind over its tyrants fear and anger." To a candid, scientific mind, of course, these are mere meaningless phrases. It is impossible to conceive the human mind, in any sort of circumstances, freed from the "fetters of sense," or entirely exempt from the possibility of fear or anger under all circumstances; while as for memory being a purely physiological phenomenon, upon which thought is entirely dependent, we suppose nothing is now more firmly maintained by rational psychologists.

Dr. Worcester's method of evangelical therapeutics is simple in the extreme. He has "caught on" to the secrets of that school of pseudo-scientists who have for some time been regaling the world with elaborate accounts of the "subconscious mind." Our readers need not be reminded of the wonderful revelations of this school—how they have been expatiating to us on the "subliminal self," "dual personality," "dissociation of the consciousness" and "unconscious cerebration." For them there is a whole nether world in psychology, a subterranean labyrinth of thought, in which hypnotism, hysteria, suggestion and psychasthenia have their natural habitat. Into this region they fearlessly descend, and there find such marvels of underground psychiatry that the whole of mental science is likely to become in their hands a sort of adjunct to the science of mining engineering. All this region, of course, is dark, obscure and ghostly, and as such it offers peculiar attractions to the clerical mind. We have, in fact, for some time been anticipating just what has happened in the case of Dr. Worcester; we have believed that some enterprising clergyman would

spy out this cavern of the occult, and attempt to pre-empt it as a region peculiarly fitted for the exercise of the clerical genius.

In a word, Dr. Worcester's book may be called an excursion into the subconscious. Its author has plunged boldly into these abysmal depths, and there promises to perform such wonders as will put Aladdin in a prehistoric past. "Dissociation of the personality," "double consciousness" and the "subconscious mind," these are some of the fetching terms which the author has learned to use with a facility not excelled by any of the followers of Janet and Boris Sidis. He claims that hysteria is entirely an affair of the "subconscious mind," and he seems to think that all that a benevolent parson has to do in order to effect a cure is to go down into the cellar of thought and with a little clerical unction lubricate the underground machinery, and all will be well!

We feel that we are hardly called on seriously to criticise such a scheme. It seems to us like a travesty of science (a mere pseudo-science) for a disillusioned clergyman to leave his proper parochial work, and to set up an ecclesiastical clinic in which the chief object aimed at is the ventilation and sanitation of the "subconscious mind." It is doubtless an alluring field to the clerical instinct—this "subliminal self." There the explorer is not likely to be handicapped by the strict laws of science. There he can have a sort of go-as-you-please field in which suggestion and faith and hysteria and psychotherapy have free play, and the clerical therapist can work his cures and conversions unrestrained by the facts of a critical, over-ground, common-sense world. When other clergy follow suit, as doubtless they will; when the doctors are driven out, and this dark region of the "subconscious mind" has finally become an annex of the parish, as doubtless it may; then, indeed, we shall believe that the era of "mysticism and spirituality," which Dr. Worcester devoutly foresees, is really coming upon us!

We have no intention of being unjust to Dr. Worcester. He wisely states that he makes no claim to cure organic disease. He believes his proper calling is the cure of functional disorders. If he will adhere to this resolution; if he will in the future confine himself strictly to the "subliminal"; if, in other words, he will keep his work well out of sight, then indeed shall we be thankful.

JAMES HENDRIE LLOYD.

Studies in Paranoia. By N. GIERLICH, M. D., and M. FRIEDMANN, M. D. Translated and edited by SMITH ELY JELLIFFE, M. D. Pp. IV + 78, being No. 2 of the Nervous and Mental Disease Monograph Series published by Jour. of Nerv. and Ment. Dis. Pub. Co., 64 W. 56th St., New York.

This monograph consists of two parts, translations from the German. The first is the paper on "Periodic Paranoia and the Origin of Paranoid Delusions" by Dr. Nikolaus Gierlich of Wiesbaden, and the second is "Contributions to the Study of Paranoia" by Dr. M. Friedman of Mannheim.

The paper of Gierlich is based upon the careful analysis of three cases especially with reference to the psychogenesis of the paranoid delusions, and his conclusions are reached only after a free discussion of the situation in the light of the recent literature along these lines. As a result of his analysis he is unable to ally himself to either of the opposing groups of psychiatrists who claim, on the one hand that the paranoid delusion is a pure intellectual disorder or on the other, that it is primarily referable to the emotions. He takes a middle ground and says, "The foundation of delusion formation, in my opinion, consists in disturbances of the mental condition by violent protracted emotions of expectancy, suspense, anxiety, anger, envy, etc., in combination with an existing weakness of judgment towards these highly accentuated ideas."

Friedmann's paper is a masterly analysis and critique of a number of cases, some reported at considerable length. As a result of this analysis he differentiates certain types of paranoid delusional formation. First: He describes certain mild forms which occur by preference in women between thirty and forty years of age. The patients although sensitive, exalted and obstinate in character had never been mentally abnormal; they possessed normal intelligence and gave no history of specific etiology such as alcohol or senility. They developed, after a serious conflict of some sort, in the course of months, a system of delusions which concerned itself with the conflict and which led to the accusation of certain persons, but the delusion formation was limited exclusively to this single chain of ideas. There were ideas of reference but never hallucinations. The whole course covered two or three years and ended by a fading of the affect, a regaining of calm, but absolutely no correction of the ideas. Especial stress is laid upon the endogenous as opposed to the exogenous formation of the delusions, the distinction between which the author believes to be of more importance than the distinction between systematized and unsystematized. Second: The author cites several cases of exogenous delusion formation and comes to the conclusion that all of the cases that recovered were forms of manic-depressive insanity. Third: Certain other cases of endogenous formation having an episodic course occur in persons of normal intellect with "fixed" or "overvalued" (Wernicke) ideas but without delusions of reference. These cases the author thinks present the same types of reasoning as the fanatic—they might be said to have a "fanaticism of suspicion" in the same way we speak of fanaticism of faith, religious or political hatred.

Omitting the second group, which really does not belong with the paranoid forms, we see that two varieties of "endogenous delusion development" have been described which, with the chronic paranoia, the author groups as follows: "First: The delusion formation, once started, progresses slowly but inevitably, and the affect does not again become calmed down (genuine chronic paranoia). Second: The delusions remain confined to the conflict, but the delusions fade again and the affect disappears within a space of a few years. Third: We have nothing more than cloud-

ing of judgment of a simple kind and ideas of reference are few, or entirely wanting, conditions which for the most part run an episodic course."

This brief summary gives a very inadequate idea of the work of the two authors in this monograph, particularly the excellent case studies of Friedmann. The questions discussed by both authors, however, are particularly timely as the "Paranoiafrage" is very much in the air, with the result that there is a decided reactionary movement against the erstwhile prevailing opinions as to its necessary chronicity and hopelessness as dominated more particularly by Magnan and Krafft-Ebing. The method of approach to the problem is, too, an excellent example of the application to psychiatry of the methods of careful individual analysis of cases with an attempt to explain the mechanism of the production of the symptoms. The cases of Friedmann are particularly enlightening in this respect and deserve careful reading.

The work as a whole will well repay reading by the neurologist and the psychiatrist as being particularly rich in suggestion both as to prognosis and treatment.

Ninth Annual Report of the State Board of Insanity of the Commonwealth of Massachusetts for the Year Ending November 30, 1907. (Boston: Wright & Potter Printing Co., State Printers, 1908.)

The object of the State Board of Insanity is clearly stated at the beginning of this report to be investigation and recommendation. "It has no direct control over local administration and internal regulation of institutions. Its direct powers relate to general relations between institutions, the classification and transfer of patients between them, discharge on appeal, investigation as to claims for support in institutions, collections for support if private funds are available for the purpose and deportation out of the State for those who have such claims elsewhere. Family care of the harmless is under the control of the Board."

The whole number of insane persons in the State of Massachusetts October 1, 1907, was 12,735, being 1 to 244 of the estimated population. The annual increase of insane patients during the past few years renders it probable that the State must provide about 500 additional beds each year. There is little new besides this rather discouraging announcement. The usual statistical tables are published. An interesting discussion as to the eight-hour law for attendants is given in the Appendix. It seems evident from reading it that those who passed the act rendering an eight-hour day obligatory were much more interested in the "rights of organized labor" than in those of the insane. It is evident also that the compensation of nurses both male and female has been inadequate, the average monthly wage in one institution being for women nurses \$19.51, and for men \$25.93, but the remedy is not so much an eight-hour law as a higher grade of education and a more attractive service. The advent of unionism in any charitable institution is deplorable and education and training are the only efficient means of preventing the evil.

Nursing the Insane. By CLARA BARRUS, M. D., Woman Assistant Physician in the Middletown State Homeopathic Hospital, Middletown, N. Y. (New York: The Macmillan Company, 1908.)

While a number of excellent works upon nursing the insane have appeared during past years, and while the volume before us is probably the best that has yet appeared, the ideal book upon this subject yet remains to be written.

It would take too much space to enumerate the many good points in this work, and the chief defect may be summed up in a few words, it is that it is written more for the use of the nurses of the hospital with which the writer is connected than for general use. As a consequence, details are frequently given where generalities would be better for those not at Middletown. This defect fortunately does not seriously interfere with the excellence of the book and it will doubtless become popular as a text-book. The author is to be congratulated upon her literary style, which is clear and forcible without lacking smoothness, as so often happens. It is written directly to the reader, the second person being frequently used, this doubtless being the form in which Dr. Barrus delivers her lectures.

The book contains no illustrations, but it would seem that they are better omitted, as the nurse can learn better from actual demonstration than from pictures. The printing, binding and general make-up are all of the highest order.

W. R. D.

Fourth Annual Report of the Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis. February 1, 1906, to February 1, 1907. Edited by JOSEPH WALSH, A. M., M. D. (Philadelphia: Published by the Henry Phipps Institute, 1908.)

This report is always an interesting one, and perhaps especially so at the present time on account of the increased interest in tuberculosis due to the recent congress held in Washington. The present report contains 15 papers, and we naturally, perhaps, turn to the neurological report by Dr. McCarthy. Here two cases of tuberculous meningitis are reported with considerable detail, followed by others in which different parts of the nervous system were involved. The relationship of mental disease and nervous disease in the family and in the patient have been investigated, but as yet the data are too few from which to draw conclusions, but it may be said that the mental attitude of patients is more hopeful than is shown by previous reports. Sleep and dreams, memory and delusions, have also been investigated with interesting results.

The next most interesting paper, perhaps, is that of Dr. Geo. B. Wood, entitled the Importance of the Upper Respiratory Tract in the Etiology of Cryptogenetic Infections, especially in Relation to Pleuritis. In 37 cases of pleuritis 3 were found to be non-tuberculous, and in 29 of the remaining 34 the tonsils showed typical lesions of tuberculosis. A summary is given of reported cases of various forms of disease following tonsillitis.

In appearance the book is quite up to the usual standard.

W. R. D.

Report from the Pathological Department, Central Indiana Hospital for the Insane, 1903-1906. (Indianapolis: Wm. B. Burford, 1908.)

This is an attractively bound and printed volume of 392 pages, the majority of which are given over to reports of the autopsies made by Dr. Chas. F. Neu, until recently pathologist at this institution. These are grouped according to psychosis, which naturally renders them more convenient for reference.

Considerable space is given up to abstracts of cases which have been presented at the staff meetings. These are not grouped according to diagnosis, are frequently too brief to be convincing, and it seems to us were better omitted. The same might be said of most of the tables which follow and which are not specific enough to be of value.

The papers which Dr. Neu read before the Marion County Medical Society have been reprinted here, thus placing them in a convenient form for reference. A brief description and plans of the Hospital for Sick Insane, as the receiving wards are called, concludes the volume, which is attractively printed and bound, and is an addition to the literature of this class.

W. R. D.

Department of Neurology, Harvard Medical School. Contributions from the Massachusetts General Hospital, the Boston City Hospital, the Long Island Hospital and the Neurological Laboratory. Vol. III. (Boston: 1908.)

In the excellence of its component papers and mechanical attractiveness this volume equals its predecessors. It is composed of those papers published during 1907 by the neurological staff of the Harvard Medical School, namely, Drs. J. J. Putnam, E. W. Taylor, P. C. Knapp and R. M. Smith. A majority of them appeared in the Boston Medical and Surgical Journal, only two of the total of ten having been published in other journals, and as a consequence the appearance of the book is more uniform than is the rule in reprint books.

The convenience of having the publications of these men in so accessible a form is great, and we hope that this plan may be continued in future years.

W. R. D.

Thirty-Seventh Annual Report of the Board of Commissioners of Public Charities of the Commonwealth of Pennsylvania for 1906; also the Report of the General Agent and Secretary, Statistics and the Report of the Committee on Lunacy, transmitted to the Legislature January, 1907. (Harrisburg: State Printer, 1908.)

The Report of the Committee on Lunacy contains as usual much food for sober thought. All the State hospitals for the insane in Pennsylvania are overcrowded and additions are made so slowly to their capacity, there seems little possibility that the State will ever be able to provide for all her insane. There were upon September 30, 1906, 14,311 insane patients

under institution care in Pennsylvania and of these 5236 were in county asylums; 8685 were in State hospitals and private institutions; and 47 in penitentiaries, jails, etc. The system of county care seems to have gained the adherence of some additional counties during the previous year and the secretary of the Committee on Lunacy speaks with a degree of satisfaction of the relief thus afforded to overcrowded State hospitals. Nothing is said of the degree of overcrowding in these county institutions, and it is evident that the condition of the insane in them is probably no better than in the former institutions. What is needed in Pennsylvania, as in many other States, is a settled, uniform, consistent policy, extending over a number of years and looking towards some definite end. State care was adopted some years ago, without giving any thought to the erection of adequate buildings for the accommodation of patients in State institutions and a temporary recourse was had to a so-called county system with an idle optimism that the State would eventually erect proper buildings to make State care practicable. This hope can never be realized as long as the question is dealt with in its present inconclusive manner. Other States have met the same difficulties and have surmounted them by the consistent execution of a definite policy. Pennsylvania to-day scatters and wastes money enough among its various State-assisted general hospitals to build an adequate State hospital for the insane annually. She should change her methods.

Abstracts and Extracts.

Zur Prognosestellung bei der Dementia praecox. Von MARIE-EMMA ZABLOCKA. Allgemeine Zeitschrift für Psychiatrie, Band 65, Heft 3, 1908.

This work was done in the Kantonanstalt Burghölzli, Zurich, under the direction of Professor Bleuler. The question to be answered was the following: What is the relation between the degree of dementia after the first acute period, and the symptoms, and the duration of the prodromal period, and the age of the patient at the onset, and the psychical and physical condition of the patient at the time of onset, and the immediate causes?

The cases were received in Burghölzli from January 1, 1898, to December 31, 1905, and were 647 in number, 342 women and 305 men, of whom 84 women and 69 men are still in the institution. One hundred and thirty-two patients have not been under observation long enough to allow a definite prognosis to be made, and are, therefore, not considered in this article. On discharge the cases were divided into three groups, those being light, medium, and severe dementia.

The cases were divided into the following disease types:

	Total.	Men.	Women.
Hebephrenics	206	125	81
Catatronics	174	55	119
Paranoid forms	135	68	67

On discharge the condition of these patients was as follows:

Dementia.	Light.	Medium.	Severe.
Hebephrenics .	119 (58%)	44 (21%)	43 (21%)
Catatronics	101 (58%)	26 (15%)	47 (27%)
Paranoid forms	87 (65%)	22 (16%)	26 (19%)

The conclusions reached are as follows:

(1) About 60% of the cases in whom the prognosis could be determined show after the first onset light dementia, about 18% a medium degree, and about 27% show a severe dementia.

(2) The form of the disease has a certain influence on the dementia following the first outbreak. In men the catatonic form has the worst prognosis, the paranoid form the best, while the hebephrenic form occupies a middle position as far as the dementia is concerned. In women the catatonic form does not show as much dementia after the first onset as it does in men.

(3) The relations between the degree of dementia after the first onset and the manner of onset is shown clearly. The chronic cases have the

worst prognoses, while the acute cases after the acute period has passed may return to the condition in which they were before the attack. Naturally this refers only to those cases who come into an institution.

(4) The influence of the age at the time of onset on the prognosis cannot be clearly demonstrated. One can only surmise that an onset before the age of puberty or between the ages of 35 and 45 would show a more unfavorable prognosis.

(5) The stronger influence of the catatonic symptoms especially on the outcome of the first onset of dementia præcox is only shown in men in whom they seem to point to an unfavorable prognosis, but do not influence it to a high degree. There is a certain connection between single catatonic symptoms and the prognosis. Negativism and stereotypy have a bad prognosis, while cases with hypersuggestibility and especially those with catalepsy show a lighter degree of dementia.

(6) The physical condition before the onset has no striking effect on the prognosis. There is, however, a certain relation between the general mental disposition before the onset and the result in that those of a retiring disposition show a worse outcome than the normal. Those patients who were formerly of a nervous disposition show a proportionally good result. The degree of intelligence before the onset has no marked influence on the outcome.

(7) Aniscoria is the only pupillary disturbance which seems to render the prognosis a little more unfavorable.

(8) The exciting causes seem to have no noticeable influence on the outcome.

RICKSHER.

Contribution a l'Etude de la toxicite urinaire dans les maladies mentales et nerveuses. Par DR. A. MARIE. Archives de Neurologie, Vol. II, 4th series. Numbers 8 and 9, 1908.

A brief account is given of the work which has been done on this subject from the time Bouchard formulated his views on autointoxication up to the present time.

The first of the author's work was done to determine the toxicity of dialysed urine of epileptics. A portion of the urine was placed in sacs made of ordinary collodion and these sacs were placed in a box in which water constantly kept circulating from the tap for twenty-four hours, then in distilled water for twenty-four hours. The urines thus dialysed were injected into the ear of a rabbit. The animal was killed with a dose of 87 cc. per kilogram of animal. Another rabbit into whose ear undialysed urines were injected required 104 cc. per kilogram for a lethal dose. As distilled water is toxic on account of its hemolytic action, the dialysed urine was rendered isotonic by NaCl and injected into a rabbit. It required 156 cc. per kilogram to kill the animal.

The animal was killed not only by the toxicity of the liquid injected, but also by the enormous quantity injected.

In order to take the influence of quantity into consideration it was necessary to calculate the urotoxic coefficient, and this shows that the undialysed urine is less toxic than the dialysed.

The conclusions drawn from this are:

- (1) With the toxins eliminated with the urine there are also antitoxins.
- (2) These antitoxins are dialysable and one can, by this means, separate them from the toxins with which they are held in feeble combination.
- (3) The proportion of the urotoxic coefficients of dialysed urines and nondialysed urines is equal to the inverse proportions of the corresponding fatal doses.
- (4) These proportions indicate the relations between the elimination of toxins and antitoxins.

Experiments were made with urine from cases of epilepsy, dementia præcox, senile dementia, mania and from alcoholic degenerate.

The author's conclusions are as follows:

We believe that our experiments show that there is an undisputable relation between the urinary toxicity and the chemical composition of the urine. In order to show these relations, however, it is necessary to group the patients by diseases.

This parallelism between the chemical properties and the urinary toxicity is sharply shown by the urea. The cases of dementia præcox and the maniacs present a complete parallelism. Among the epileptics we have a single exception to this rule.

In eighteen patients there was a complete correspondence between the urinary toxicity and the results of cryoscopy in fourteen, that is, each time there was a hypertoxicity there was no renal disturbances, and each time there was a urinary hypotoxycity there was a renal insufficiency revealed by cryoscopy. Only four cases showed exceptions to this rule, in two, the hypertoxicity was only slight and it is not astonishing that cryoscopy did not reveal a renal disturbance.

In this way the urinary hypotoxycity seems to be explained by an obstacle opposed to the passage of the toxins in the renal filter, of the retention of the toxins in the organism and defective nitrogenous auto-intoxication.

In epileptics the crises are more frequent when the urinary intoxication is strongest. This is explained as follows:

The accumulation of toxins may be explained by two causes acting together or separately:

- (1) The retention of the toxins or their poor elimination following some obstruction of the renal filter.
- (2) The overproduction of toxins or the poor destruction of toxins by the liver, the thyroid or other glands whose function it is to eliminate poisons.

The overproduction of toxins, or their poor destruction, causes them to appear in the blood and urine, but if the kidney does not functionate properly a part of the poisons remain and accumulate until they produce

a sharp and energetic reaction. It is evident that if the overproduction is great and is accompanied by a renal obstacle, the accumulation of toxins may quickly reach its maximum point while the urine at the same time may be hypo- or hypertoxic and the crises frequent. If the overproduction of toxins is slight the same renal obstacle will stop almost all the poisons filtered from the blood into the urine. One then has a condition of urinary hypotoxicity accompanied by rare epileptic crises because a much longer time is necessary for the poisons to accumulate to the degree necessary to produce the same reaction.

If only the retention of toxins existed, how could one explain the hypertoxicity before the crises or very frequent crises accompanied by a marked hypertoxicity.

RICKSHER.

Sur les accessoires de l'habillement dans la démence précoce et dans la psychose maniaque-dépressive. Note semiologique par GAETANO BOSCHI. Nouvelle Iconographie de la Salpêtrière, 21st Année, p. 75, Janvier-Février, 1908.

This paper is unusually well illustrated by photogravures and is a pleasant excursion into one of the by-paths of psychiatry, rather than of especial clinical value. The author's conclusions are too long to reproduce here, but the most important are that in the insane, ornamentation of clothing is a symptom of valuable diagnostic value when taken with others, as alone it has little value. In dementia præcox there may be a characteristic stereotypy shown in the ornamentation, while in the excitement of maniacal-depressive insanity there may be many changes. Those depressed and those excited but not happy do not ornament their clothing. A change of sex in ornamentation is more frequent in women than in men and in the maniacal than in the demented.

W. R. D.

La glande thyroïde chez les aliénés. Par J. RAMADIER ET L. MARCHAND. L'Encephale, An. 3, p. 121, aout, 1908.

The conclusions to this paper are:

The weight of the thyroid gland varies according to locality. In the asylum at Rodez 72.6 per cent of the glands weighed over 30 gm.; at Blois 31.2 per cent; at Rennes 6.6 per cent; at Villejuif 18.1 per cent.

The macroscopic lesions of the gland are especially frequent in the insane living in goitrous localities.

Microscopic lesions of the thyroid gland are very common, as much in those who have never had mental trouble as in the insane.

Of 48 glands from the insane at Loir-et-Cher, 8 were absolutely normal; 16 showed only a slight sclerosis; 5 showed sclerosed portions beside healthy areas; 14 showed a diffuse sclerosis with atrophy of the vesicles; 2 showed parenchymatous inflammation; and 1 an interstitial inflammation.

W. R. D.

Apraxie et démence précoce. Par G. DROMARD. L'Encephale, An. 3, p. 162, aout, 1908.

The author has carefully examined two cases of dementia præcox relative to their ability to perform varied movements, and comes to the following conclusions:

(1) There is an intellectual apraxia as well as a motor apraxia and a sensory apraxia.

(2) Psychologically, intellectual apraxia corresponds to a disorder in voluntary activity produced in the phase that is immediately consecutive to the representation of the act and in the course of which is effected the ideational preparation of the detailed plan of this act.

(3) Clinically, intellectual apraxia places us in the presence of a confused mass of reactions which are extremely varied and which are not always easy to unravel. These reactions are shown by omissions, misplacements, substitutions and suspensions in the course of the partial acts which by their union form a complete act. They are always associated with a greater or less disorder of the attention.

(4) The analysis of such phenomena seems to us to clear up the disorders of motility shown by precocious dementers in uniting the whole in one theory and in a single word the phenomena which have been interpreted in a thousand ways and described under most varied and inexact terms by others.

Cases of this kind studied patiently and with minute detail permit a further study of certain conditions to which have been applied the very vague term of "obnubilation"; they may also bring about suggestive contributions in the differentiation of pseudo-dementias.

W. R. D.

Ricerche sul potere riducente delle urine nella frenosi maniaco-depressiva. Del O. PINI. Manicesmio, An. XXIV, p. 155, 1908.

This research has been made in a way similar to those of Alberti, Pighini, etc. In this study ten normal individuals were studied to establish a standard, after which six cases were studied in periods of excitement and periods of depression. Observations were made for six days in each instance. As a result it was found that there is an increase of the reducing power of the urine during the period of excitement; an increase of the same, although in less degree, during the stage of depression; a diminution of it after a state of prolonged excitement and a slowing of organic oxidation especially marked in the depressive period.

W. R. D.

Der Kopfschmerz bei der Dementia præcox. Von DR. TOMASCHNY. Allgemeine Zeitschrift für Psychiatrie, Bd. 65, p. 778, 1908.

The conclusions to this study are as follows:

(1) Headache is a very frequent symptom in the course of dementia præcox as well as in the early stage.

(2) Headache in dementia præcox frequently shows a remitting and exacerbating course. It comes and goes frequently in catatonic excitement.

(3) The occurrence of headaches is a support for the theory that dementia præcox is an autointoxication disease process.

W. R. D.

Troubles psychiques par perturbations des glandes à sécrétion interne. Par M. LAIGNEL-LAVASTINE. *Journal de Neurologie*, 13 Année, p. 316, 336, 355 and 373.

This is the address in psychiatry made at the recent congress held at Dijon, August, 1909. As a summary, or epitome, of our knowledge of the mental disturbances commonly associated with change in function of the internal glands is a valuable communication. Naturally, such a paper does not allow a good abstract, as it is of itself so much condensed, but the author's conclusions, which were submitted to the congress for discussion, are of interest and are here given:

(1) There is a causal relationship between disturbances of the internal secretory glands—thyroid, parathyroid, suprarenal, ovary, testicle—and their corresponding syndromes: myxædema, exophthalmic goitre, tetanus, eclampsia, gigantism, acromegaly and Addison's disease and ovarian insufficiency and deviation.

(2) Is there a causal relationship between these same disturbances and certain psychic disorders, accompanied by their respective syndromes?

(3) If so, which psychic disorders, and by what criteria may we recognise as of glandular origin? May we admit a glandular origin for the psychic disorders such as are found in the majority of the insane where the respective glandular syndromes are not easily appreciable?

(4) Taking into consideration cerebral predisposition, may we admit the possibility of a glandular origin of certain cases of cerebral weakness, dementia præcox, partial delirium, functional nervous disorders, hysteria, neurasthenia, psychasthenia?

The consensus of opinion was that the first of the above was quite true, the second probable and the third and fourth possible.

W. R. D.